SPRING 1986 VOLUME 1 NUMBER 3

Ohio Economic Trends Review

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Ohio Economic Trends Review publishes articles about current public finance and economic development issues of interest to state and local government policymakers and administrators, scholars, students, and individuals who monitor the state's economic and financial condition for the private sector.

Ohio Economic Trends Review is produced by the Fiscal Futures Service at Cleveland State University's College of Urban Affairs and is edited by the Board of Editors. Views expressed in articles are those of the authors and do not necessarily reflect official positions of the Fiscal Futures Service.

Funds for *Ohio Economic Trends Review* are provided by Ohio's Urban University Program, which focuses the talents and resources of the state's urban universities on the revitalization efforts of its urban communities. The Ohio General Assembly established the program in 1979 through the Ohio Board of Regents.

The Urban Center at Cleveland State University, of which the Fiscal Futures Service is a part, was created as a model for joint university and community efforts. The seven other Ohio urban universities participating in the Urban University Program include the University of Akron, the University of Cincinnati, Kent State University, The Ohio State University, the University of Toledo, Wright State University, and Youngstown State University.

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Articles are reviewed by members of the Board of Editors. No particular approach or research method is favored and manuscripts are invited from all disciplines. Reviewers evaluate manuscripts in terms of the value of the information for the readership, the contribution they make to advancing knowledge about public finance and economic development, and their clarity and quality.

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CSU Cleveland State University

College of Urban Affairs

The Urban Center
Euclid Avenue at East 24th Street
Cleveland, Ohio 44115

Telephone: (216) 687-2134

Ohio Economic Trends Review

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Toward an Economic-Topographic Map of Ohio: The Seven Largest Metropolitan Areas / page 1

Philip R. Thompson, a research associate at Cleveland State University's College of Urban Affairs, examines an alternative way of measuring a state's hospitality to economic development. This innovative approach departs from traditional measures by focusing on local economic activity within the state and by breaking this activity into a series of broad occupational-functional roles that are common to all industries.

This first reporting of the occupational-functional profiles of the seven largest metropolitan areas in Ohio is intended to set the stage for a follow-up article, scheduled to appear in the *Ohio Economic Trends Review*.

Profile of the Cleveland Economy / page 23

Although Cleveland has been hard-hit by declines in the manufacturing sector, the city's greatest strength still lies as an exporter of producer durable goods, according to George Williams and Cheryl Bolas, both of the Greater Cleveland Growth Association.

This assessment and others are outlined in their article, the second in a series profiling Ohio's major metropolitan areas. The first article of the series — titled "Transformation of the Akron Economy" — appeared in the Winter 1986 issue.

Recession and Recovery in Ohio's Industries / page 27

Last year, Ohio set a record for the number of persons in the labor force, while experiencing modest gains in total employment and non-farm wage and salary employment. Also in 1985, unemployment continued to decline and industry employment patterns ranged from healthy increases in construction, trade and services, to declines in manufacturing and mining.

Dixie Sommers, director of the State of Ohio's Labor Market Information Division, reviews these job indicators for 1985, comparing the year with 1984. She also discusses the state's job losses and recovery between 1979 and 1985 and examines the effects of Ohio's manufacturing industry structure and national manufacturing employment trends.

Toward an Economic-Topographic Map of Ohio: The Seven Largest Metropolitan Areas

By Philip R. Thompson

The Problem of Measuring Economic Hospitality

The most closely watched, and criticized, index of **business climates** is that of the Alexander Grant Company, which purports to rank states according to their hospitality to economic development. This index has served to provide journalists with eye-catching copy on slow "news days." The newsworthy nature of the copy arises from the fact that there is something for almost everyone: The winners of the state rating contests are delighted to have some "hard" evidence to support their industrial promotion efforts, and the losers are provided with some ammunition to back up their demands for larger industrial development planning budgets, or their arguments for lower taxes and wages.

There are, however, two serious flaws in the Alexander Grant index. First, the state is not a single, indivisible economy: The reasons or consequences to the firm of locating within the Cleveland metropolitan area are considerably different from locating in rural Southeast Ohio. Second, the states ranked highest in their business climate index are those that are in the earlier stages of industrial development. In 1984, Florida was first, South Dakota was second, and Arizona was fifth; while Michigan was last, Ohio was third from the bottom, and Illinois was fifth from the bottom. Those with the lowest scores on this index are the most mature industrial states.

This inverse ranking between industrial maturity and favorability for business should have been a warning to the user. For example, the states ranked according to educational measures (such as earned doctorates in science and engineering at local universities) is generally the reverse of their favorability for economic development, with Michigan having a far better educational system than Florida. One cannot believe that the very processes which lead upward in education lead downward in economic competitive position. Something seems amiss.

The usual fumbling in the first efforts at a single measure of state business climate has been expanded into measures of the position and potential of a **local** economy along **several** alternative, sometimes complementary, and sometimes sequential paths to economic development and redevelopment. This approach involves breaking local economic activity into a series of broad occupational-functional roles that are common to all industries — rows of comparative advantage that cross the many industry columns.

True, the characteristics that an electronics firm is seeking in an area are likely to be quite different from those of a steel-maker. But so too the **headquarters** of an electronics corporation may have locational preferences more in common with the **headquarters** of an automotive parts producer than either does with its own plants, or even laboratories. When a firm begins life, all parts of it are likely to be located in the same place, but once its success is established, and especially when it attains large size, the various functions and occupations within the firm tend to be performed at different locations.

For example, Detroit is the center of the automotive industry and at one time had almost all parts of the automobile industry located within the Detroit metropolitan area. Thus, the inventors of automobiles and their improvements gave birth nearby to the early entrepreneurs, who in turn were the forebears of the headquarters of the automobile corporations that watched over the production of the automobiles themselves. Today, the Detroit metropolitan area still has the headquarters of the American automobile corporations, and much innovation and entrepreneurship in automobiles still goes on there, but the trend since 1950 has been to vary the location of production, sometimes to where labor costs and taxes are lower, more and more outside the country, and most recently toward a reconcentration to small places in the Midwest and Mid-South.

Therefore, it is useful to identify occupational or functional roles within an industry (the rows across a column of industries). For example, when the worldly-wise Mr. Robinson, in the Hollywood movie *The Graduate*, whispered "plastics" into the ear of Dustin Hoffman, he was giving a tip on an industry but leaving open the choice of occupation within it. Thus, within the plastics industry the ambitious young man must still weigh the role of technologist, or manager, or entrepreneur: alternative paths of opportunity through the laboratory, or the accounting class, or cheap loft space.

Philip R. Thompson is a research associate for the Urban Economic Development Program at the College of Urban Affairs, Cleveland State University.

When judging the ability of an area to attract industries one should evaluate the local ability to play alternative occupational roles within those industries. At least five distinct roles, or paths of economic development, come to mind that encompass fully and group conveniently the scores of occupational classifications of the Bureau of the Census:

- Entrepreneurship, capturing the propensity to start new businesses;
- Central administration, performing the headquarters function;
- Research and development, serving as a center of science and technology;
- Precision operations, focusing on industries that employ more craftsmen and technicians; and
- Routine operations, ranging across manufacturing, trade and services.

These five broad "occupational-functional" classes are intended to be exhaustive in coverage but not at all mutually exclusive or independent of each other. As work progresses, alternative sets of sub-classes should emerge within these five broad groupings to address different policy issues, e.g., disaggregating "precision workers" into blue-collar trades (e.g., tool and die-makers), white-collar work (e.g., accounting and marketing), and "white coat" skills (e.g., medical laboratory technicians). Similarly, research and development by its very title suggests a natural division, one which the Census data supports with separate counts of scientists and engineers. Finally, combining entrepreneurial creativity with financial risk-taking — innovators with venture capitalists — may blur two distinct roles and personalities.

Thus, for routine operations, the Alexander Grant Company may be an adequate index, but for the role of research and development center, where educational levels and institutions are of considerable importance, the Alexander Grant Company index of state business climates is clearly inadequate, even perverse.

These roles correspond roughly to the major occupational classifications used by the Bureau of the Census. Routine operations corresponds to the occupation "operators, fabricators and laborers," precision operations corresponds to the occupation "precision production, craftsmen and repair," research and development corresponds to "professional specialty occupations," and central administration corresponds to the occupational classification "executive, administrative and managerial." "Entrepreneur" is not an occupational classification used by the Census, so our indexes had to reach beyond Census data on self-employment into magazines such as *Inc.* and *Venture*.

It is possible for local economies to shift between industries, or re-industrialize, by exploiting or leveraging their proficiency at a given occupation. This abstract thesis may be made vivid through using individual case histories. For example, the current president of Apple Computer, John Scully, is the former president of Pepsi Cola and was hired by Apple for his management and marketing skills rather than for his knowledge of computers, the personal equivalent of the horizontal move of a place using its headquarters skills to cross industry columns. Consider, for example, corporate mergers and acquisitions that carry places with them into new industrial cultures, e.g., General Motors acquisition of Electronic Data Systems is a shift from automotive manufacturing into electronics.

Alternatively, a person or a place could shift occupations within a given industry through upward mobility. For example, Alfred Hitchcock began his career in the movie industry by putting titles and credits on movies (routine operations). He proved so adept at this he was promoted and assumed more technical duties in film production (precision operations), and from there he innovated new techniques of filmmaking such as better camera angles and backlighting (research and development). After that he directed movies (management), and finally he could attract investors and produce his own movies (entrepreneurship).

"When judging the ability of an area to attract industries one should evaluate the local ability to play alternative occupational roles within those industries."

Metropolitan areas can move along occupational rows and across industry columns (and vice versa) in much the same way as individuals. Most Midwestern manufacturing areas are being forced by low-wage foreign labor to move upward from routine to precision work, and will soon need to reach more into research or management to remain competitive in a given industry. Much of the wealth made in Boston during its golden age of textile, paper and shoe manufacturing was transferred to foundations or into endowments for local universities. As a result, when these old industries faltered, Boston could evolve into a center of research and development. One of the rich legacies of profitable steel and automaking is the strong higher educational system across the Midwest and significant foundation assets per capita. Flint has the highest foundation assets per capita among the 72 largest metropolitan areas; Pittsburgh is 5th; Cleveland is 15th; and Youngstown is midpoint, i.e., 36th.

In addition to the single-industry, single-occupational role limitation of the Alexander Grant index, the state is not a single, indivisible economic unit. The unit of analysis being used in the database is the metropolitan area.

Metropolitan areas are appropriate because they are natural local labor markets. Those who **work** within a given metropolitan area also usually **live** within the same area, and those who **live** within a given metropolitan area can usually commute to **work** offered almost anywhere within that area, a characteristic not true of municipalities or states.

Given fully five economic development paths, how does one go about measuring a metropolitan area's strengths and weaknesses on them? There were 318 metropolitan areas defined by the Bureau of the Census in 1980. These varied in size from the New York Standard Consolidated Area of about 16 million people to the Midland,-Texas, metropolitan area of about 83,000. For the purpose of building an index of economic development along five alternative paths, comparing so wide a range of metropolitan areas seems no more defensible than comparing the 48 contiguous states.

The database assumes that metropolitan areas of more than one million population play different roles in the national economy than those of medium-large size, for example, between one-half million and one million population. The size of hinterlands (that is, the non-urban areas surrounding the metropolitan areas), density, costs of production, and other locational determinants differ enough to require comparing a place to its population peer group. For the 32 metropolitan areas of more than one million population, the largest member (New York SCA) is about 16 times the size of the smallest member (Sacramento). For the 40 metropolitan areas with between one-half and one million population, the ratio is two to one. The two size classes have been combined for correlational analysis. While the 16 to 1 ratio of largest to smallest metropolitan area in the more than one million population size class is bothersome, a ratio which increases to 32 to 1 in the statistical analysis, it is still better than the 193 to 1 ratio that would be obtained if all 318 metropolitan areas were treated equally.

The five-path indexes are defined and their sources given below. The rationale behind these indexes can be found in other papers (Thompson & Thompson, 1983, 1984, 1985, 1986a,b,c).

Indexes of Metropolitan Area Comparative Advantage

There were 32 areas of more than one million population in 1980, of which 14 were SCAs and 18 were SMSAs not in SCAs. There were 40 SMSAs with between one-half and one million population in 1980. For the larger size class, Standard Consolidated Areas were used (so the Cleveland SCA also contains Akron). The SMSAs of less than one million population were **not** included with the 16 SCAs to which some of them belonged for the smaller size class. Therefore, Akron is here considered without Cleveland.

A metropolitan area is assigned a rank for each index (first rank will always mean most favorable for economic development, e.g., the lowest work stoppage rate or the highest percent of college graduates). By inspecting the ranks of many locational factors, an indication of the favorability of a given metropolitan area for each economic development path may be obtained. This procedure readily lends itself (perhaps too well) to lists: first-best metropolitan area for research and development; second-best metropolitan area for headquarters work; third-best metropolitan area for precision operations; and all other combinations.

There is no single summary number for each path, because not all locational indexes are of equal weight, because paths have subdivisions within them, and because a profile conveys more information than a list of numbers. These indexes are presented as a graph so the profile can be seen visually as well as described analytically. One can gauge the strengths and weaknesses of a metropolitan area at a glance by observing the pattern of the arrows on each of the five scales. The Cleveland metropolitan area is profiled in Figure 1. The indexes are listed under their respective paths in Appendix I.

Its profile can be generalized as follows:

- well below average in routine operations;
- above average in precision operations;
- well below average in research and development;
- well above average in central administration; and
- below average in entrepreneurship.

Often a metropolitan area will exhibit a high scatter of arrows on a given path, probably indicating that the function has been defined too broadly; that is, it has within it two or more distinct sub-classes in which the locality has different positions. For example, a metropolitan area might have a weak position in creativity but much-available risk capital (both are kinds of entrepreneurship) or strength in manufacturing corporate headquarters but weakness in service industries (kinds of administration).

The most elusive of the five economic development paths to measure is entrepreneurship, the beginning of the economic development cycle. In other papers (Thompson, P. R., 1985, 1986a,b) it is argued that entrepreneurs constitute a distinct personality type, one which is shared with others in creative occupations (such as actors or painters) and which is distinctively different from personality types in other business occupations (such as managers). Therefore, the entrepreneurship indexes range across the percent employed as authors and designers (the creative), the percent self-employed, and the percent of small businesses, as well as measures of venture capital and fast-growing companies.

The Cleveland metropolitan area is about average for the four non-Census indexes of business entrepreneurship: venture capital per capita 1982-84; employees of *Venture* "fast-track" companies per capita 1982-84; employees of *Inc.* "fast-growth" companies per capita 1981-84;

and employees of the *Inc.* private 500 companies per capita 1984 (the ranks 13, 21, 22, and 14 average to 17.5). On the other hand, Cleveland is below average for the two measures of creativity (percent authors, rank 25, and percent designers, rank 21). It is also below average for measures of "proprietorship," such as self-employment (total, rank 30; female, rank 31; black, rank 24); percent of manufacturing establishments with fewer than 20 employees (rank 22); and the percent of business service employees who work in firms with 1-4 employees (rank 16).

Its highest measures are correlates of its strength in corporate headquarters: percent working in advertising (rank 13) and percent of managers working in marketing, advertising and public relations (rank 6-7). These are included because new, small firms need advertising to overcome the advantages of product familiarity possessed by their larger, established competitors.

The different performance of Cleveland on business entrepreneurship, non-business creativity and proprietorship is maintained across the entire population of 72 metropolitan areas. There are no significant correlations between non-business creativity and either entrepreneurship or proprietorship. Only minor correlations are exhibited between entrepreneurship and proprietorship. The strongest correlations for this path were between percent authors, percent designers and metropolitan area population (50 percent explained variance), suggesting that these occupations require either the cultural diversity or economies of scale of large metropolitan areas, or both. These results reinforce the hypothesis of subdivisions within the five broad paths.

Cleveland's strongest path is central administration. Here the natural division is between manufacturing and service industries. For the industrial *Fortune* 500 (rank 4) and 2nd 500 (rank 2), and the percent of manufacturing employees working in central administrative offices (rank 6), Cleveland is above average. The *Fortune* measures are designed to reflect headquarters power and are expressed as a ratio of the worldwide employees of the corporation to the 1980 population of the metropolitan area within which the corporation headquarters resides. The percent of manufacturing employees in central administrative offices is intended to reflect headquarters employment.

National advertising agencies rose with national manufacturers, since only the latter can afford national advertising (retail advertising is usually done in-house). Cleveland ranks 13th in the percent of the employed working in advertising and 6-7th in the percent of managers working in marketing, advertising and public relations.

Cleveland is 7th and 9th, respectively, in foundation expenditures and foundation assets per capita, probably a reflection of the past accumulation of resident wealth in steel and other heavy manufacturing. By contrast, Columbus ranks only 24th in foundation assets per capita and Sacramento is last.

Cleveland is below average in service headquarters, e.g., the *Fortune* Service 500 (rank 20) and for the percent of employed female managers (rank 28). The latter index is used to reflect the extent to which heavy manufacturing has excluded women. For example, although women now buy 40 percent of all automobiles (a statistic projected to increase to 50 percent by 1990) the "Big Three" car companies have no marketing information on how women car buyers differ from men. A first assumption that women want luxury most (Dodge once introduced a two-tone pink car with color-coordinated orchid upholstery) proved false. A marketing survey conducted by the publisher of *Vogue* found that women rate dependability and economy first and second, respectively (*Newsweek*, March 24, 1986, p. 54). A female executive might have been able to tell them that immediately.

> *"Indeed, analyzing metropolitan areas is like trying to set a wristwatch using a sundial. The sundial lacks the precision of the wristwatch, but the operation can be performed only one way."*

Total aircraft departures is a measure of ease of travel for executives. Net export of enplaned passengers is a measure of the extent to which Cleveland is an air service hub. It is defined as the total enplaned passengers for the SMSA or SCA minus its expected share ([1980 SMSA population/1980 U.S. population] × [total enplaned passengers]). This index is **not** correlated significantly with absolute size; Atlanta ranks first.

Other indexes used are the percent of employed blacks who are managers, the percent working in commercial research, management and data processing, and the percent of employed technical writers. Technical writers do not exhibit a correlation with other writers, but rather intercorrelate with commercial research and data processing (56 percent explained variance). The percent of employed blacks who are managers is an attempt to measure the sensitivity of firms to a market for black people. McDonald's, for example, has been very successful using black advertising firms to market its hamburgers to blacks living in urban areas.

Cleveland is well below average for research and development: 24th rank in R&D dollars per capita in local colleges and universities; 26th in the percent of employed natural scientists; 27th in its percent of college graduates among those 25 and older; and 27th in the per capita number of Ph.D.s awarded in science and engineering between 1975 and 1980. The relatively higher ranks of doctoral scientists per capita (15th rank) and scientists and engineers working in business per capita (11th rank) may be due to the age of the National Science Foundation

data (1974-75). The trend for Cleveland in R&D from 1970 to 1980 has been downward; in 1970 Cleveland was above average for this path.

Cleveland's above average performance in precision operations is in part a reflection of weakness in routine operations — its loss of unskilled jobs. For example, it is likely that its low quit-rate in manufacturing (rank 6) is due in large part to the weak job market for the unskilled. Its percent of owner-occupied housing (rank 10) is an index of loyalty to a metropolitan area. Since quit-rate and home-owners are not significantly correlated for the 72 metropolitan areas, their effects can be considered additive.

The other indexes reveal greater strength with increasing precision in the measurement. Thus, Cleveland is 22nd in the ratio of "precision production, craftsmen and repair" occupations to "operators, fabricators and laborers"; 21st in the percent of technologists and technicians (except health) within the employed; 15-16th in the percent of engineers within the employed as given in the 1980 Census of Population; and 11th in the National Science Foundation survey of scientists and engineers working in business. It is average in its percent of high-school graduates among those over 25 (rank 19).

"Policy-making requires that the work extend to the state level by analyzing the urban system within the state, where measurements can be more precise."

For routine operations, Cleveland's position is below average. It is average as a place to live for a family with a low budget (rank 15); its wages are high for clerical work in non-manufacturing (rank 22) and higher for unskilled plant manufacturing pay (rank 30-31); and for the percent of time lost due to work stoppages it is 31st of 32. Its rate of female labor force participation is 23rd (so there are relatively few families with two wage earners) and its average hourly earnings in manufacturing are 26th.

For comparison, the profiles of the other six Ohio metropolitan areas are given in Figures 2-7. The trends from 1970 to 1980 (expressed in terms of net change in ranks) are given in Figures 8-14. It is not possible to give rank changes for all 1980 indexes, since many measures did not exist in 1970. It is also not possible to give as many indexes for smaller metropolitan areas as for larger ones. For example, below one million population the *Venture* and *Inc.* measures become zero for all but a few metropolitan areas. When a rank is available it is given; if the data are not available for the index, or would merely be an average of many zeros, they are omitted.

Economic-Topographic Profile of Ohio

The metropolitan area, defined as the job commuting radius that bounds the local labor market, is a close approximation of the local economy. But it is not a unit of government. There is a glaring lack of effective metropolitan area government in the United States. Even the exceptions to the rule — city-county consolidations — usually lag events; most of the new suburban growth is in contiguous counties beyond the reach of the new "metropolitan area government" by the time it takes effect. The only exception to this rule is chance geography of the tiny State of Rhode Island, where 97 percent of the state's population is located in the Providence-Warwick-Pawtucket metropolitan area. In general, when a metropolitan area analysis is finished, there is just no one to hand it to.

Indeed, analyzing metropolitan areas is like trying to set a wristwatch using a sundial. The sundial lacks the precision of the wristwatch, but the operation can be performed only one way. Policy-making requires that the work extend to the state level by analyzing the urban system within the state, where measurements can be more precise. It is the state which bears responsibility for arranging the economic furniture within its own house. The distribution of funds for state universities — especially graduate programs in science and engineering — has become the critical variable in the geographic distribution of employment in research and development. Columbus may lack significant foundations, but it has captured a very disproportionate share of the state's higher education budget.

Similarly, state transportation policy, planning and public works build hubs and networks that sometimes create new centers and affect the competitive position of those places not chosen. These, in turn, nurture headquarters roles in some cities rather than others. Those who allocate state funds for higher education and transportation have more control over the settlement pattern of the state for the decades to come than they know or perhaps welcome.

The charts that accompany this article are intended, collectively, to be a first draft of an economic-topographic map of Ohio that roughly sketches the occupational-functional peaks and valleys of the state, serving as a guide to the official path-finders in state economic development policy-making and programming. The reasoning has now come full circle: After beginning by rejecting the state as a true local economy in measurement and diagnosis, the **political-economy** critical to prescription requires us to look to the state.

First Impression of the Terrain

For routine operations, only Columbus and Cincinnati show an even average performance, reflecting their lower wage rates; and Cincinnati alone has not experienced rising relative wage rates. Therefore, Ohio should probably expect to experience continued decline in competitive position as a site for routine operations, as unskilled work moves south in the United States and out of the country. The rise of seven ranks in the competitive position of Akron on the index "unskilled plant pay in manufacturing" (coupled with a decrease of four ranks on the index "average hourly earnings in manufacturing" and a decrease of eight ranks in "percent of working time lost to stoppages") probably illustrates this conclusion. Jobs in Akron for less-skilled workers have apparently become increasingly lower-paying, non-union jobs.

'One of the challenges of future economic development in Ohio will be to follow the lead of the industrial East by identifying determinants of entrepreneurship and to develop policies for promoting entrepreneurs within Ohio.'

For precision operations, only Youngstown rated below average and only Youngstown lost ground from 1970 to 1980. Therefore, it appears that Ohio shows statewide strength in precision operations. The improvement may follow partly from the state's heavy loss of routine manufacturing operations and the low quit-rate of skilled workers.

For R&D, the results are mixed. The location of the state's largest university in Columbus has created a strong center. The other strong center (Dayton) is largely the effect of Wright-Patterson Air Base. Akron and Cincinnati are average performers. Cleveland and Toledo are below average, with Youngstown very low. This may be related to the statewide trend toward improvement in competitive position for precision operations. Ted Hiser (former assistant dean in the College of Urban Affairs at Cleveland State University) offered four reasons to explain the gain in competitive position of Cleveland for precision operations and the loss in position for R&D:

- The State of Ohio spent its educational budget from 1970 to 1980 creating new four-year undergraduate colleges and community colleges, rather than creating new graduate programs;
- Cleveland lacked a top-ten research university during the peak funding years for federal science grants;
- There was a general population shift from the Frostbelt to the Sunbelt, therefore a relative increase in undergraduate and graduate enrollment in states competitive with Ohio; and
- Oil-rich states such as Texas could, in the 1970s, lure Nobel Prize-winning professors to their state universities with richly endowed chairs.

The emphasis on undergraduate (rather than research-doctorate) programs, which the State of Ohio maintained from 1970 to 1980, may therefore explain both some of the improvement in two precision manufacturing indexes (the percent of the employed who are technologists and technicians, and the ratio of skilled to semi-skilled and unskilled workers) together with the slippage in the R&D indexes.

In the headquarters role, three metropolitan areas (Akron, Cleveland and Dayton) are strong; Cincinnati is average; two are bi-modal (Columbus and Toledo show distinct clusters for each *Fortune* 500 index); and only Youngstown is below average. From 1970 to 1980, Akron and Cleveland held their above average rank, while Cincinnati, Columbus, Dayton and Toledo actually improved their positions. Only Youngstown lost ground. Therefore, headquarters work is a promising economic development path across much of Ohio.

Robert Premus, economics professor at Wright State University, suggested that for many established middle-size corporations and for existing branch headquarters of *Fortune* 500 corporations, Dayton is losing ground in the central administration path. Nevertheless, it is net flows that are important. What headquarters moved into Dayton at the same time?

For entrepreneurship, only Dayton rates an above average performance, with Youngstown showing strength in small business. Youngstown may be exhibiting much involuntary self-employment: Since Youngstown is below average on all other economic development paths, what else is there to do after being let go but leave Youngstown or try to employ oneself? Moreover, Youngstown is increasing its score only in service self-employment, not manufacturing self-employment. From 1970 to 1980, only Dayton had an average performance in entrepreneurship and held onto that position.

The Ohio pattern resembles much of the industrial Midwest, but **not** the industrial East. The region centered around New York scores above average on the indexes of entrepreneurship. These elevated scores reach south to Philadelphia, and westward to somewhere between Philadelphia and Pittsburgh. Therefore, unlike routine manufacturing operations, the low competitive position of the industrial Midwest on entrepreneurship is **not** a difference between the Frostbelt and the Sunbelt. One of the challenges of future economic development in Ohio will be to follow the lead of the industrial East by identifying determinants of entrepreneurship and to develop policies for promoting entrepreneurs within Ohio (Thompson, P. R., 1985, 1986a,b).

Next Steps

This first reporting of the occupational-functional profiles of the seven largest metropolitan areas in Ohio is intended to set the stage for a follow-up article, scheduled to appear in this journal. The many policy implications of the comparative advantages and disadvantages of various Ohio sub-economies will be explored, as they move along these five broad paths of local economic development. Most important, a second impression may be gained of the Ohio system of cities, as seen from the State Capital, in policy-making perspective.

Author's Note: The conceptual framework upon which this article is based is the creation of Wilbur R. Thompson, Professor Emeritus in the Department of Economics at Wayne State University and Albert A. Levin Professor of Urban Studies and Public Service at the College of Urban Affairs, Cleveland State University. Funding has been provided by a grant from the Northeast Ohio Urban University Fund and the U.S. Economic Development Administration. I thank Anthony Stocks, Barbara Rolleston and Robert Premus for their comments.

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Appendix I

(An unabbreviated listing of the indexes by economic development path as used in the charts that accompany this article.)

Entrepreneurship

Venture "fast-track" 100, 1982-84 average*
Venture capital per capita, 1982-84 average
Inc. "fast-growth" 100, 1981-84 average*
Inc. private 500, 1984*
Percent self-employed: total, females, blacks
Percent of the employed who are authors and the percent who are designers
Percent of manufacturing establishments with fewer than 20 employees, 1982
Percent of business service firms with 1-4 employees (1-3 employees in 1967) expressed as a percent of all firms and as an estimated percent of all employees
Percent of all employed working in advertising
Percent of managers working in marketing, advertising, public relations

Central Administration

Fortune 500, 1983*
Fortune 2nd 500, 1982*
Fortune service 500, 1983*
Percent of manufacturing employees working in central administrative offices, 1982 or 1967
Foundation assets and expenditures per capita, 1980
Percent of all employed who work in advertising
Percent of all managers working in marketing, advertising and public relations
Percent of all employed working in commercial research, management and data processing
Percent of all employed who are technical writers
Percent of all employed females who are managers
Percent of all employed blacks who are managers
Total aircraft departures in 1981 (for SCAs or SMSAs of more than one million population only)
Net export of enplaned passengers, 1982 (the total enplaned passengers of the SCA or SMSA of more than one million population minus its population share of all enplaned passengers)

Research & Development

Percent of all employed who are natural scientists
Percent of all employed who are engineers
Percent of those 25 years and older with four or more years of college
Per capita science and engineering doctorates granted within the SCA or SMSA from 1975-80 or 1961-70
R&D expenditures per capita in 1980 in all colleges and universities within the SCA or SMSA
Per capita doctoral scientists and engineers in the 1975 National Science Foundation survey using the average of the 1970 and 1980 populations

Precision Operations

Percent of those 25 years and older who are high-school graduates
Percent of all employed who are technologists & technicians (except health)
Percent of all employed who are engineers
The ratio of precision production, craftsmen and repair workers to operators, fabricators and laborers
Per capita scientists and engineers employed in business, National Science Foundation Survey of 1974, using an average of the 1970 and 1980 populations
Percent of all occupied housing which is owner occupied
Quit-rate in manufacturing, 1979-80 or 1969-71

Routine Operations

Average hourly earnings in manufacturing, 1983
Unskilled plant manufacturing pay
Office clerical pay in non-manufacturing
Female labor force participation
Percent of all working-time lost to stoppages, 1978-80 or 1969-71
Cost of living for a low-budget family (available for only 23 SMSAs; rank is made proportional to 32)

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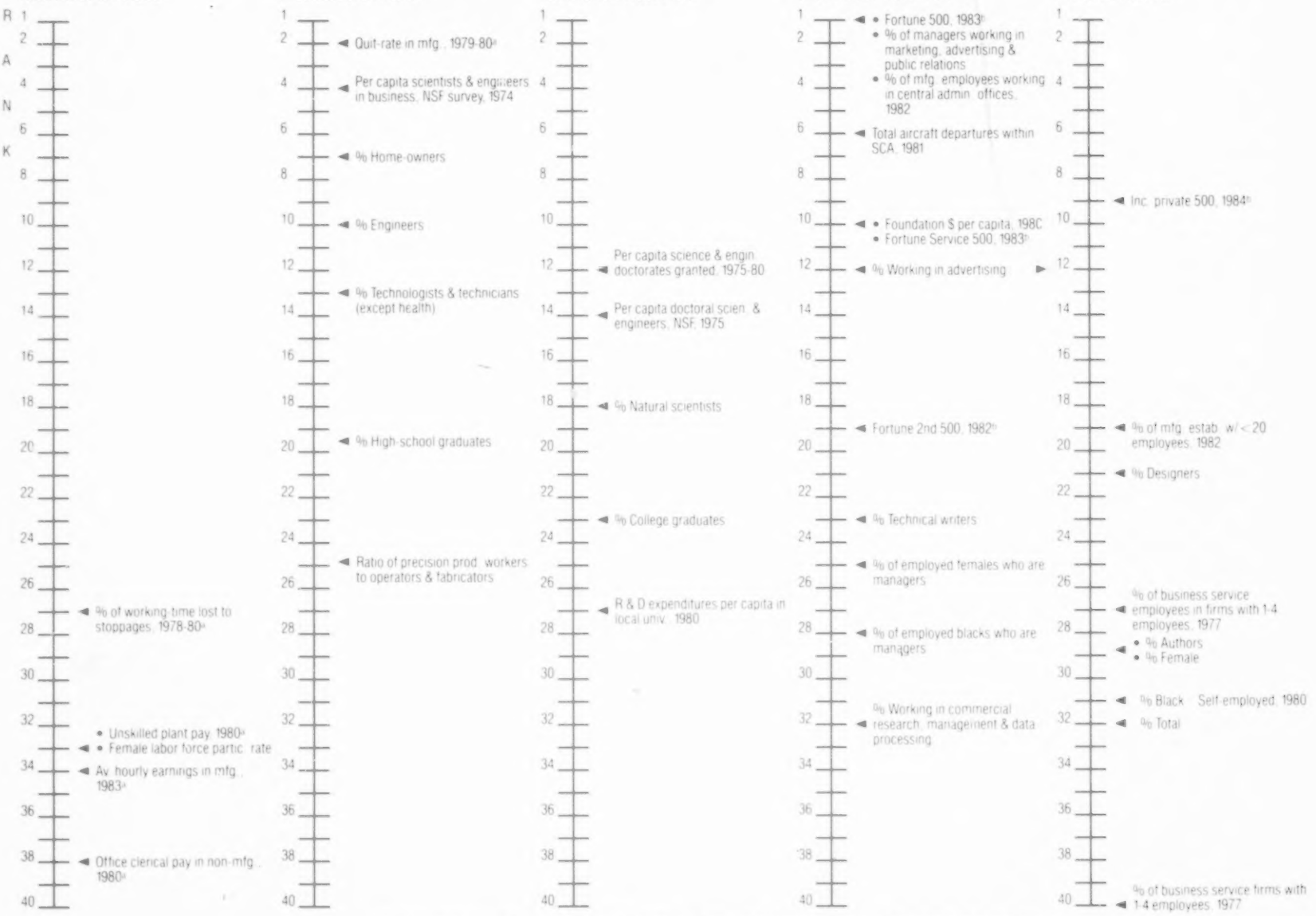
*Ratio of worldwide corporate employees to population of SCA or SMSA with corporate headquarters

FIGURE 1: **Comparative Position of the Cleveland Metropolitan Area Among the 32 Largest Metropolitan Areas on Selected Measures Along Five Alternative/Complementary/Sequential Economic Development Paths**

ROUTINE OPERATIONS
RANK
Cost of living, low budget, N=28[a]
Office clerical pay, non-mfg., 1980[a]
Female labor force participation rate
Average hourly earnings in mfg., 1982[a]
Unskilled plant mfg. pay[a]
% of working time lost to stoppages, 1978-80[a]
PRECISION OPERATIONS
Quit rate in mfg., 1979-80 average[a]
% Owner-occupied housing
Per capita scientists & engineers employed in business, NSF 1974
% Engineers
% High-school graduates
% Technologists & technicians (except health)
Ratio of precision prod. workers to operators & fabricators
RESEARCH & DEVELOPMENT
Per capita doctoral scientists & engineers, NSF 1975
R&D expenditures at universities
% Natural scientists
• % College graduates
• Per capita science & engin. doctorates granted, 1975-80 (SCA)
CENTRAL ADMINISTRATION
Fortune 2nd 500 (SCA)[b], 1982
Fortune 500 (SCA)[b], 1983
% of mfg. employees in CAO, 1982
% of man. in mark., ad., p.r.
Expenditures Foundation $ per capita
Assets
% Working in advertising
• Fortune Service 500 (1983) SCA[b]
• Total aircraft departures, 1981
% of employed blacks who are managers
% Working in commercial research, mngt. & data proc.
• % of employed females who are managers
• Net export of enplaned passengers, 1981
% Technical writers
ENTREPRENEURSHIP
Venture capital per capita 1982-84 (SCA)[b]
Inc. private 500, 1984[b]
Business service firms w/1-4 employees, % of employees, 1977
• Venture "fast track" 100, 1982-84 (SCA)[b]
• % Designers
• Inc. "fast growth" 100, 1981-84 (SCA)[b]
• % of mfg. est. w/< 20 emp., 82
% Black self-employment
% Authors
% Total self-employment
% Female self-employment

[a] Low values carry high rank.
[b] Ratio of worldwide employees of corporation with local headquarters to local population (1980). Standard Consolidated Area used.

FIGURE 2: **Position of the Akron Metropolitan Area Among the 40 Metropolitan Areas of Between One-Half and One Million Population on Selected Measures Along Five Alternative/Sequential/Complementary Economic Development Paths, 1980**


ROUTINE OPERATIONS
PRECISION OPERATIONS
RESEARCH & DEVELOPMENT
CENTRAL ADMINISTRATION
ENTREPRENEURSHIP
RANK
Quit-rate in mfg., 1979-80[a]
Per capita scientists & engineers in business, NSF survey, 1974
% Home-owners
% Engineers
% Technologists & technicians (except health)
% High-school graduates
Ratio of precision prod. workers to operators & fabricators
Per capita science & engin. doctorates granted, 1975-80
Per capita doctoral scien. & engineers, NSF, 1975
% Natural scientists
% College graduates
R & D expenditures per capita in local univ., 1980
• Fortune 500, 1983[b]
• % of managers working in marketing, advertising & public relations
• % of mfg. employees working in central admin. offices, 1982
Total aircraft departures within SCA, 1981
• Foundation $ per capita, 1980
• Fortune Service 500, 1983[b]
% Working in advertising
Fortune 2nd 500, 1982[b]
% Technical writers
% of employed females who are managers
% of employed blacks who are managers
% Working in commercial research, management & data processing
Inc. private 500, 1984[b]
% of mfg. estab. w/ < 20 employees, 1982
% Designers
% of business service employees in firms with 1-4 employees, 1977
• % Authors
• % Female
% Black Self-employed, 1980
% Total
% of business service firms with 1-4 employees, 1977
% of working time lost to stoppages, 1978-80[a]
• Unskilled plant pay, 1980[a]
• Female labor force partic. rate
Av. hourly earnings in mfg., 1983[a]
Office clerical pay in non-mfg., 1980[a]

[a] Low values carry high rank [b] Ratio of worldwide employees of corporation with local headquarters to local population

FIGURE 3: **Comparative Position of the Cincinnati-Hamilton Metropolitan Area Among the 32 Largest Metropolitan Areas on Selected Measures Along Five Alternative/Complementary/Sequential Economic Development Paths, 1980**

ROUTINE OPERATIONS
R
A
N
K
Office clerical pay in non-manufacturing[a]
Cost of living, low budget[a]
% of working time lost to stoppages, 1978-80 average[a]
Unskilled plant mfg. pay[a]
Average hourly earning in mfg.[a]
Female labor force partic.
PRECISION OPERATIONS
Quit-rate in mfg.; 1979-80[a]
Per capita scientists & engineers employed by business, NSF, 1974
% Engineers
% Home owners
% Technologists & technicians (except health)
Ratio of precision production workers to operators, fabricators & laborers
% High-school graduates
RESEARCH & DEVELOPMENT
% Natural scientists
Per capita doctoral scientists & engineers, NSF, 1975
R & D expenditures per capita at local college & univ.
Per capita science & engin. doctorates granted, 1975-80
% College graduates
CENTRAL ADMINISTRATION
Fortune Service 500, 1983[b]
% Managers working in marketing, advertising & public relations
% Working in advertising
• Fortune 500, 1983 (SCA)[b]
• % of mfg. employees working in central admin. offices, 1982
Foundation expenditures $ per capita
• % Technical writers
• Fortune 2nd 500, 1982[b]
• % Working in commercial research, mngt. and data proc.
% of employed blacks who are managers
Total aircraft departures, 1981
Foundation assets per capita
% of employed females who are managers
Net export of enplaned passengers, 1981
ENTREPRENEURSHIP
% of business service employees working in firms w/1-4 employees, 1977
Inc. "fast-growth" 100, 1981-84 (SCA)[b]
• % Designers
• % Female self-employed
Inc. private 500, 1984[b]
% Total self-employed
Venture "fast-track" 100, 1982-84 (SCA)[b]
% Black self-employed
Venture capital, 1982-84 (SCA) (tied at zero with 12 others)[b]
% of business service firms with 1-4 employees, 1977
% Authors
% of manufacturing establishments w/< 20 employees, 1982

[a] Low values carry high rank.
[b] Ratio of worldwide employees of corporation with local headquarters to local population (1980).

FIGURE 4: **Comparative Position of the Columbus Metropolitan Area Among the 32 Largest Metropolitan Areas on Selected Measures Along Five Alternative/Complementary/Sequential Economic Development Paths**

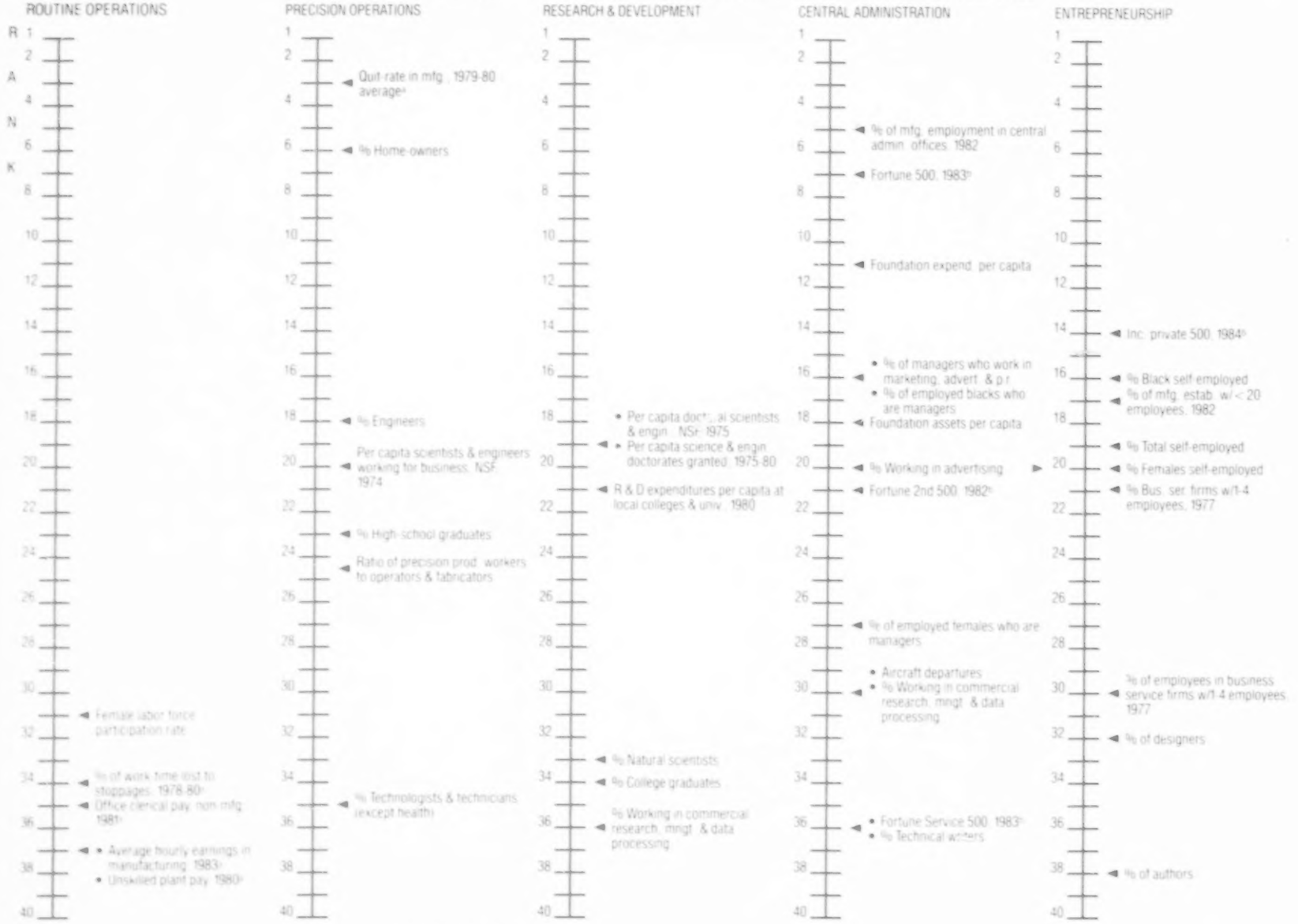
[a] Low values carry high rank.
[b] Ratio of worldwide employees of corporation with local headquarters to local population (1980). Standard Consolidated Area used.

FIGURE 5: **Position of the Dayton Metropolitan Area Among the 40 Metropolitan Areas of Between One-Half and One Million Population on Selected Measures Along Five Alternative/Complementary/Sequential Economic Development Paths, 1980**

ROUTINE OPERATIONS
RANK
% Time lost due to work stoppages, 1978-80[a]
Female labor force participation rate
Office clerical pay in non-manufacturing[a]
Unskilled plant pay[a]
Av. hourly earnings in mfg., 1983[a]
PRECISION OPERATIONS
% Engineers
Quit rate in mfg., 1979-80[a]
Per capita engineers employed in business, NSF, 1974
% Technology & technicians (except health)
% Owner-occupied housing
% High-school graduates
Ratio of precision workers to operators & fabricators
RESEARCH & DEVELOPMENT
% Working in commercial research, mngt. & data processing
% Natural scientists
Per capita doctoral scientists & engineers, NSF, 1975
R & D expenditures per capita at local colleges & univ., 1980
% College graduates, 1980
Per capita science & engin. doctorates granted, 1975-80
CENTRAL ADMINISTRATION
Fortune 2nd 500, 1982[b]
% Working in advertising
% Working in commercial research, mngt., & data processing
% of mfg. employees in CAO, 1982[b]
% of managers in marketing, advertising & public rel.
Fortune 500, 1983[b]
Foundation $ per capita
% Employed blacks who are managers
% Technical writers
Total aircraft departures, 1982
% of employed females who are managers
Fortune Service 500, 1983[b]
ENTREPRENEURSHIP
Inc. „rivate 500, 1984[b]
Inc. "fast-growth" 100, 1981-84 average[b]
% Designers
% Females self-employed
% Blacks self-employed
% of mfg. estab. w/ < 20 employees, 1982
% Authors
Business service firms w/1-4 employees, % of employees
% Self-employed, total
% of business service firms with 1-4 employees, 1977

[a] Low values carry high rank.
[b] Ratio of worldwide employees of corporation with local headquarters to local population (1980). CAO is central administrative offices.

FIGURE 6: **Comparative Position of the Toledo Metropolitan Area Among the 40 Metropolitan Areas of Between One-Half and One Million Population on Selected Measures Along Five Alternative/Complementary/Sequential Economic Development Paths, 1980**


ROUTINE OPERATIONS
RANK
Female labor force participation rate
% of work time lost to stoppages: 1978-80[a]
Office clerical pay: non-mfg. 1981[a]
• Average hourly earnings in manufacturing: 1983[a]
• Unskilled plant pay: 1980[a]
PRECISION OPERATIONS
Quit rate in mfg.: 1979-80 average[a]
% Home-owners
% Engineers
Per capita scientists & engineers working for business: NSF 1974
% High-school graduates
Ratio of precision prod. workers to operators & fabricators
% Technologists & technicians (except health)
RESEARCH & DEVELOPMENT
• Per capita doct'l. sci scientists & engin.: NSF 1975
• Per capita science & engin. doctorates granted: 1975-80
R & D expenditures per capita at local colleges & univ.: 1980
% Natural scientists
% College graduates
% Working in commercial research, mngt. & data processing
CENTRAL ADMINISTRATION
% of mfg. employment in central admin. offices: 1982
Fortune 500: 1983[b]
Foundation expend. per capita
• % of managers who work in marketing, advert. & p.r.
• % of employed blacks who are managers
Foundation assets per capita
% Working in advertising
Fortune 2nd 500: 1982[b]
% of employed females who are managers
• Aircraft departures
• % Working in commercial research, mngt. & data processing
• Fortune Service 500: 1983[b]
• % Technical writers
ENTREPRENEURSHIP
Inc. private 500: 1984[b]
% Black self-employed
% of mfg. estab. w/ < 20 employees: 1982
% Total self-employed
% Females self-employed
% Bus. ser. firms w/1-4 employees: 1977
% of employees in business service firms w/1-4 employees: 1977
% of designers
% of authors

[a] Low values carry high rank.
[b] Ratio of worldwide employment of corporation with local headquarters to local population (1980).

FIGURE 7: **Position of the Youngstown Metropolitan Area Among the 40 Metropolitan Areas of Between One-Half and One Million Population Along Five Alternative/Complementary/Sequential Economic Development Paths, 1980**

FIGURE 8: **Rank Change 1970-80 for the Akron Metropolitan Area Among the 40 Metropolitan Areas Which in 1980 Had Between One-Half and One Million Population Along Five Alternative or Complementary Economic Development Paths**

FIGURE 9: **Rank Change 1970-80 or 1967-77 for the Cincinnati Metropolitan Area Among the Largest 32 Metropolitan Areas (in 1980) Along Five Alternative/Complementary/Sequential Economic Development Paths**

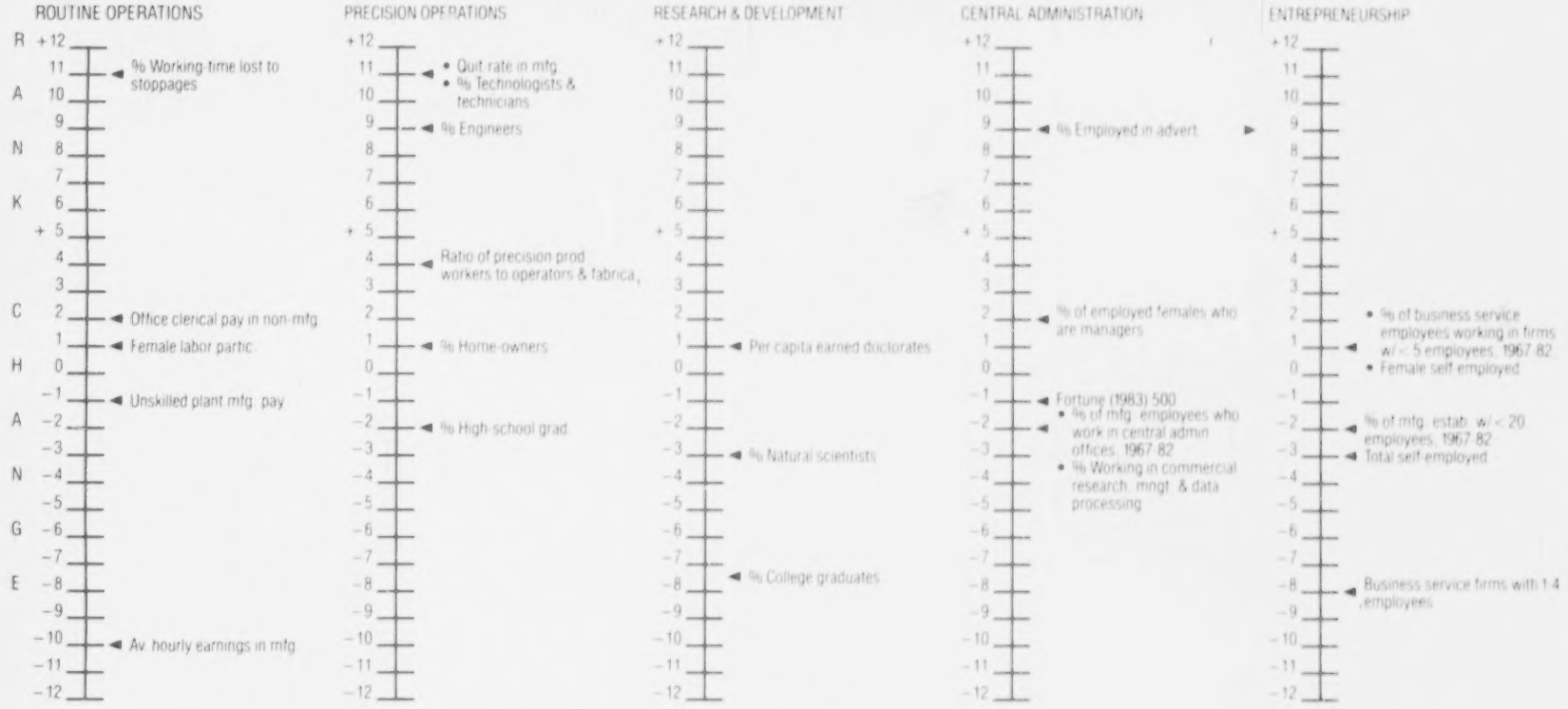
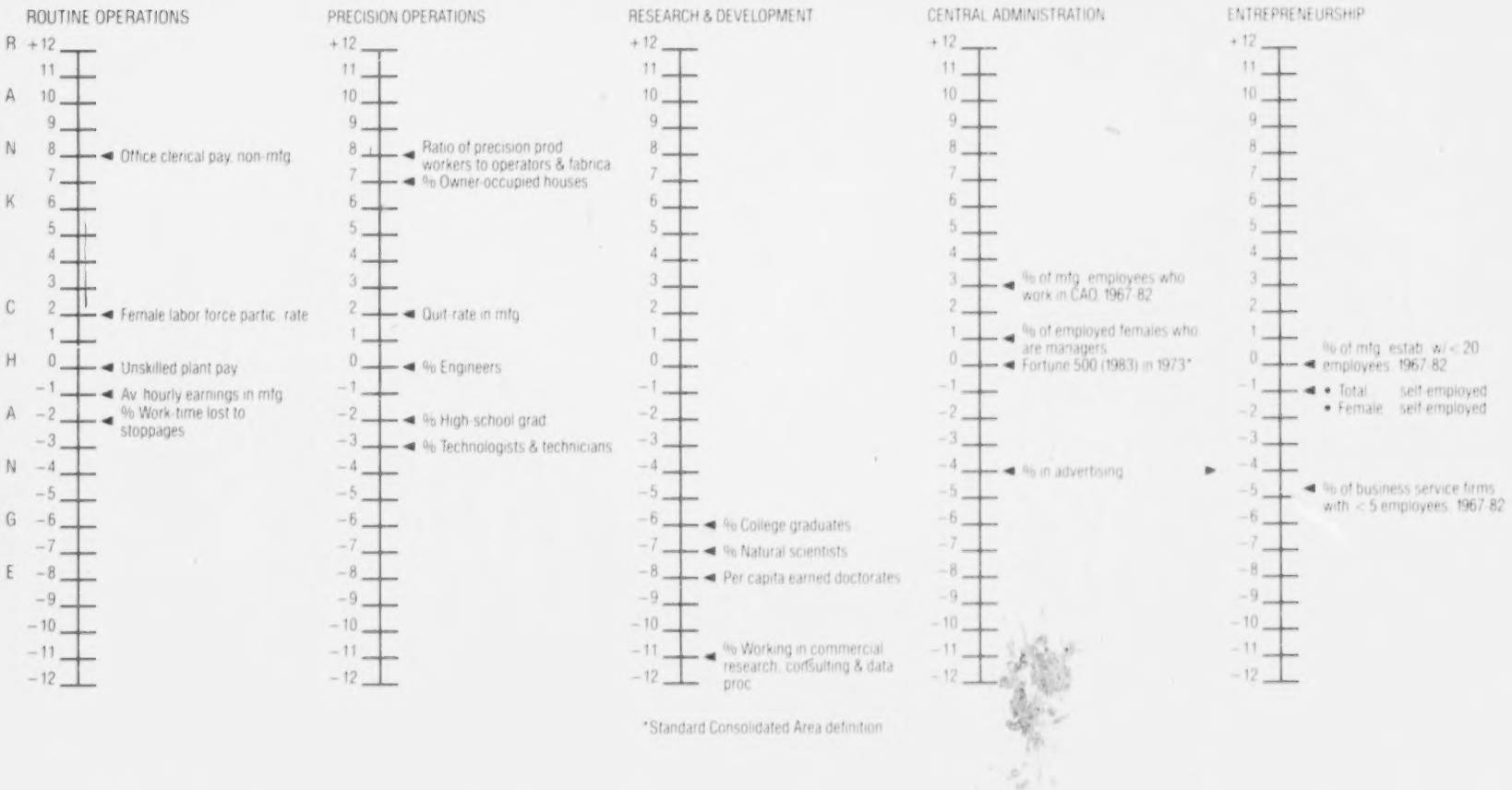


FIGURE 10: **Rank Change 1970-80 for the Cleveland Standard Metropolitan Statistical Area Among the 32 Largest Areas (in 1980) on Selected Measures Along Five Alternative/Complementary/Sequential Economic Development Paths**


ROUTINE OPERATIONS
R A N K C H A N G E
+12 11 10 9 8 7 6 5 4 3 2 1 0 −1 −2 −3 −4 −5 −6 −7 −8 −9 −10 −11 −12
Office clerical pay, non-mfg
Female labor force partic. rate
Unskilled plant pay
Av. hourly earnings in mfg
% Work-time lost to stoppages
PRECISION OPERATIONS
Ratio of precision prod workers to operators & fabrica
% Owner-occupied houses
Quit-rate in mfg
% Engineers
% High-school grad
% Technologists & technicians
RESEARCH & DEVELOPMENT
% College graduates
% Natural scientists
Per capita earned doctorates
% Working in commercial research, consulting & data proc
CENTRAL ADMINISTRATION
% of mfg. employees who work in CAO, 1967-82
% of employed females who are managers
Fortune 500 (1983) in 1973*
% in advertising
ENTREPRENEURSHIP
% of mfg. estab. w/ < 20 employees, 1967-82
• Total self-employed
• Female self-employed
% of business service firms with < 5 employees, 1967-82

*Standard Consolidated Area definition

FIGURE 11: **Rank Change 1970-80 for the Columbus Standard Metropolitan Statistical Area Among the 32 Largest Areas (in 1980) on Selected Measures Along Five Alternative/Complementary/Sequential Economic Development Paths**

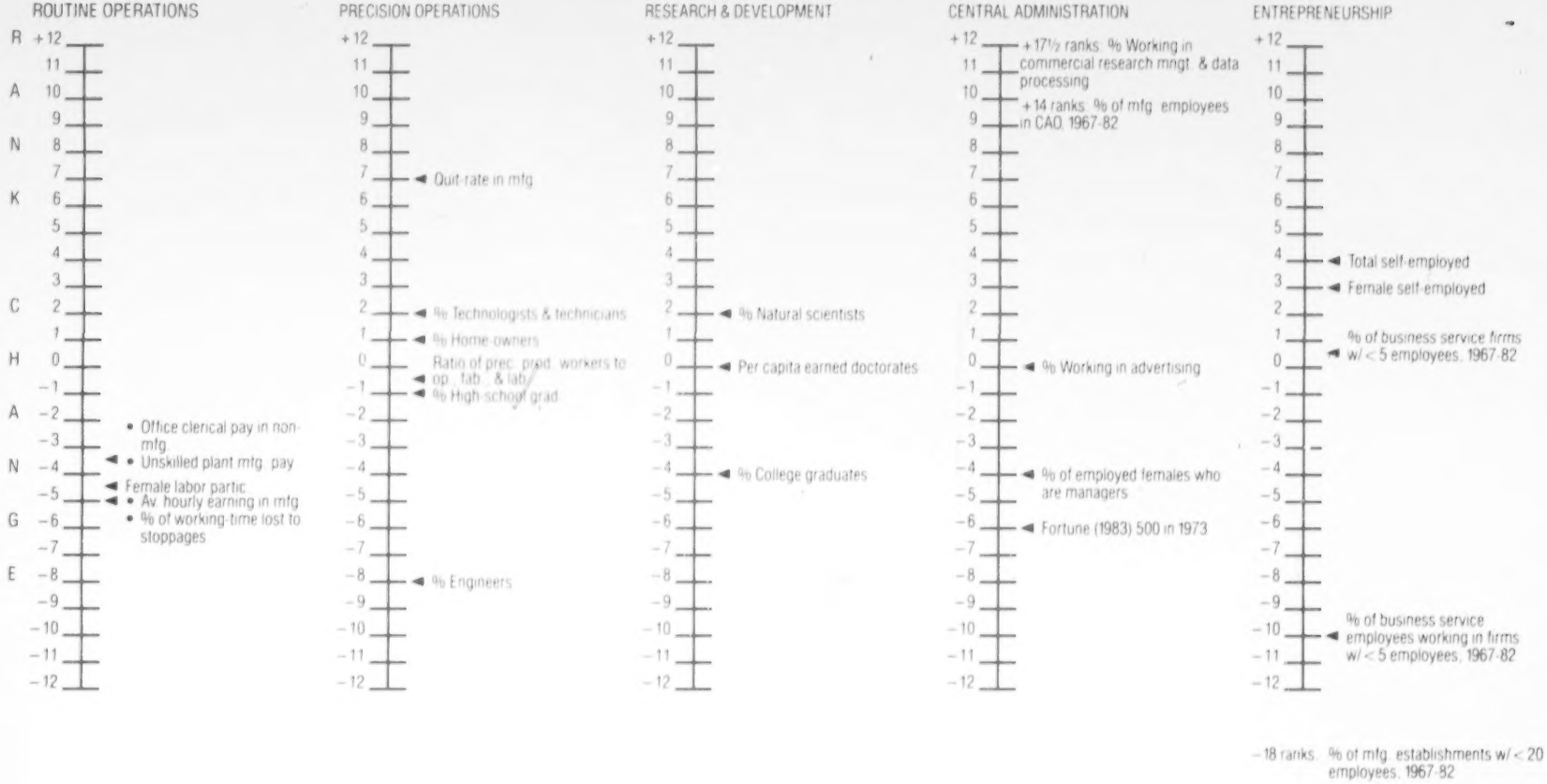

ROUTINE OPERATIONS
PRECISION OPERATIONS
RESEARCH & DEVELOPMENT
CENTRAL ADMINISTRATION
ENTREPRENEURSHIP
R A N K C H A N G E
+12 11 10 9 8 7 6 5 4 3 2 1 0 −1 −2 −3 −4 −5 −6 −7 −8 −9 −10 −11 −12
• Office clerical pay in non-mfg.
• Unskilled plant mfg. pay
Female labor partic.
• Av. hourly earning in mfg.
• % of working-time lost to stoppages
Quit-rate in mfg.
% Technologists & technicians
% Home-owners
Ratio of prec. prod. workers to op., fab., & lab.
% High-school grad.
% Engineers
% Natural scientists
Per capita earned doctorates
% College graduates
+17½ ranks: % Working in commercial research mngt. & data processing
+14 ranks: % of mfg. employees in CAO, 1967-82
% Working in advertising
% of employed females who are managers
Fortune (1983) 500 in 1973
Total self-employed
Female self-employed
% of business service firms w/ < 5 employees, 1967-82
% of business service employees working in firms w/ < 5 employees, 1967-82
−18 ranks: % of mfg. establishments w/ < 20 employees, 1967-82

FIGURE 12: **Rank Change 1970-80 for the Dayton Metropolitan Area Among the 40 Metropolitan Areas Which in 1980 Had Between One-Half and One Million Population Along Five Alternative/Complementary/Sequential Economic Development Paths**

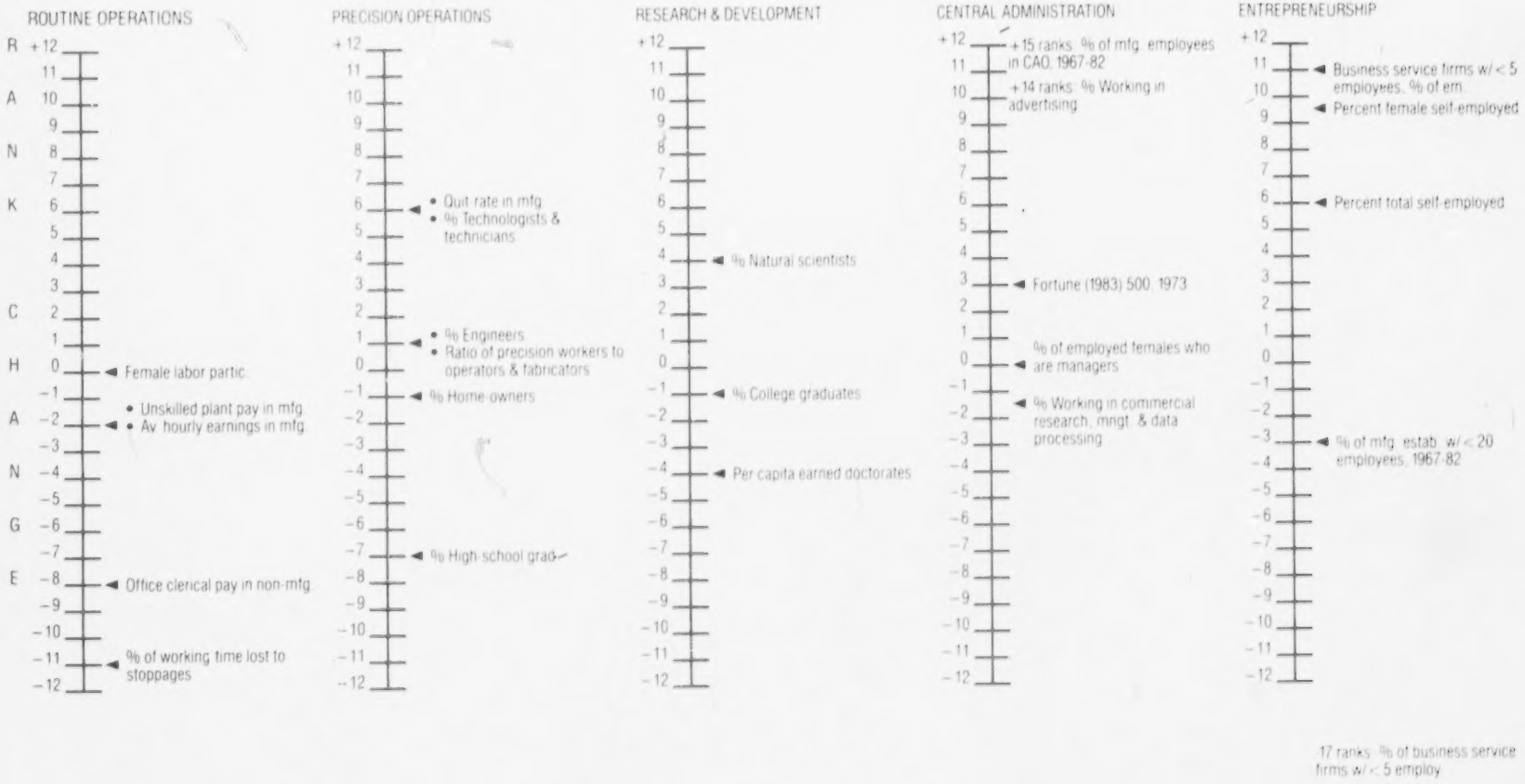


FIGURE 13: **Rank Change 1970-80 for the Toledo Metropolitan Area Among the 40 Metropolitan Areas Which in 1980 Had Between One-Half and One Million Population Along Five Alternative/Complementary/Sequential Economic Development Paths**

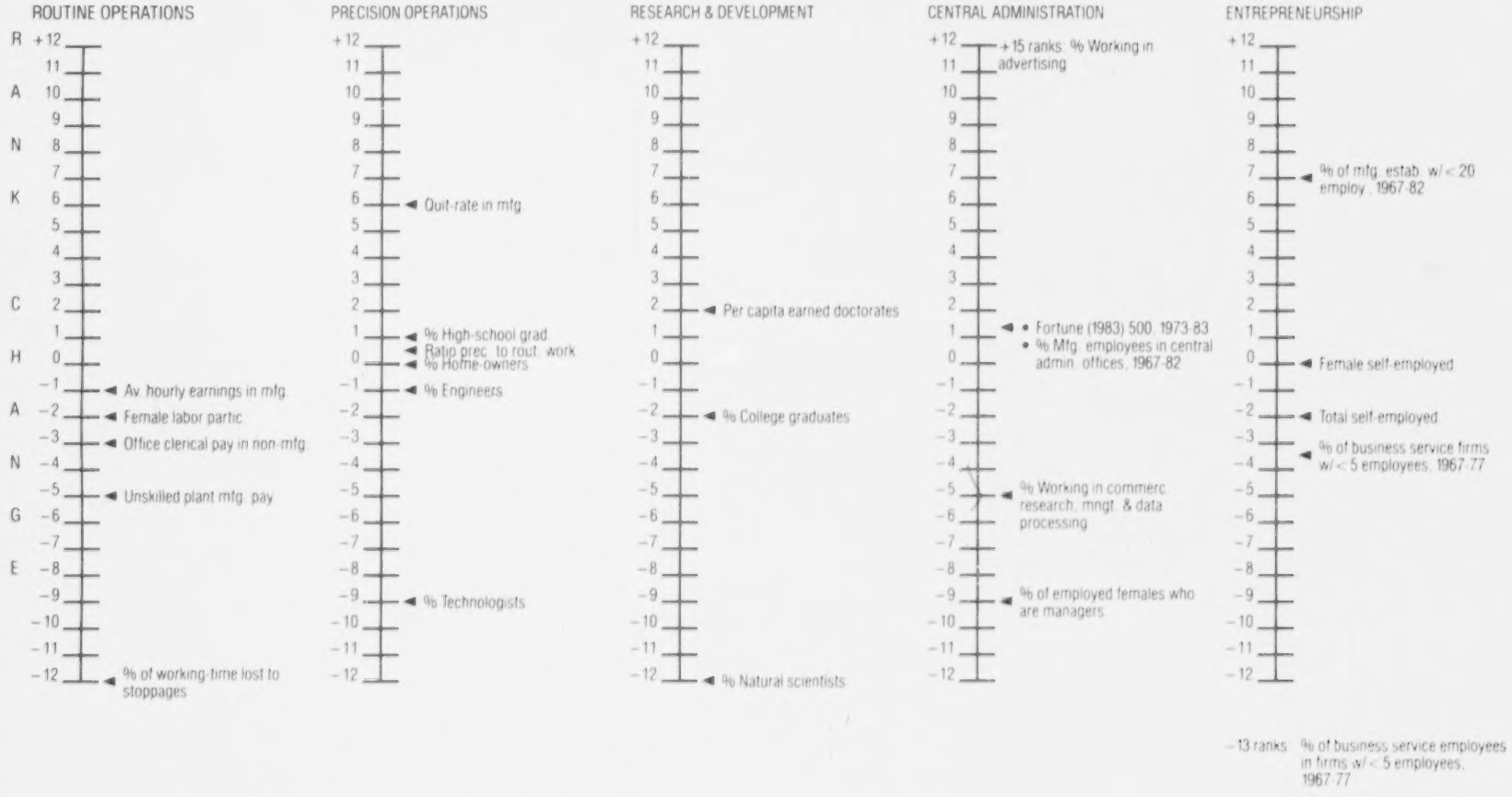


FIGURE 14: **Rank Change 1970-80 for the Youngstown Metropolitan Area Among the 40 Metropolitan Areas Which in 1980 Had Between One-Half and One Million Population Along Five Alternative/Complementary/Sequential Economic Development Paths**

Profile of the Cleveland Economy

By George Williams and Cheryl Bolas

The following description of the Cleveland economy is based in large part on the Rand Corporation Base Study of the Cleveland Economy completed in 1982.

Historical Background

The primary factor influencing Cleveland's early economic development was its strategic location to key water routes linking the East to the newly developing Northwest Territory. The opening of the Erie Canal in 1825 linked New York State and the Hudson River with the Great Lakes and brought a new wave of mass migration from Europe to inland America. The Ohio-Erie Canal, constructed in 1831, connected Cleveland with the Ohio River to the south. Consequently, Cleveland found itself in a strategic location on a natural water route, ready to accommodate the large wave of European immigration, the westward movement of the nation's population and the growing industrial development in the Great Lakes region during the latter half of the 19th century. Cleveland built harbor and dock facilities to accommodate the increase in marine traffic and became an important lake port. In 1835, nearly 2,000 boats docked in Cleveland, 70 of which were from foreign ports. Though Cleveland was an important lake port by the early 1800's, its industrial development didn't begin until the 1840's — a time when Cleveland began to benefit from iron ore from Lake Superior and coal from Pennsylvania and the South.

Two Cleveland companies owned the mining rights to a large part of Lake Superior's mining district and in 1842 began shipping iron ore from these mines to Cleveland in lake barges. At the same time, important coal deposits were discovered in Pennsylvania, Southern Ohio and West Virginia. Cleveland became a logical meeting place for coal from the South and East and iron ore from the North. It became the capital of the Great Lakes iron and coal trade. The meeting of the iron ore and coal trades led to the formation of new industries.

Cleveland started its first steel-making operations in the 1840's. To transport the iron ore from the upper lakes, boats had to be built and Cleveland became a major Great Lakes shipbuilding center. In the 1860's, John D. Rockefeller began Cleveland's first refinery, shipping oil in from Pennsylvania oil fields. By the 1890's, Rockefeller controlled 90 percent of the nation's oil manufacturing trade; and Cleveland became the nation's oil capital for the next 40 years. Other industries sprang up to store and deliver oil refined products. By the end of the 19th century, Cleveland's economy experienced tremendous growth and diversification. In 1890, 11 railroads served Cleveland. The city's manufacturing establishments grew to 2,300, and products manufactured doubled. The city's population reached 497,502 by 1900, nearly tripling in 30 years.

Cleveland's industrial growth continued into the 20th century with the birth of the automobile industry. With Cleveland's role as a center for production of iron and steel, it seemed a logical progression that Cleveland should also play an important part in the nation's emerging auto industry. One of the first automobiles manufactured in the world, the Winton car, was produced in Cleveland in 1897. The first automobile built for sale — an ice-cooled one-cylinder engine for $2,000 — was sold here by Alexander Winton. By the turn of the century, Cleveland had six major automakers. By 1914, Cleveland had emerged as the nation's No. 1 automaker with an estimated 30 percent of every dollar invested in the U.S. auto industry. The area held this position until the end of World War I, when the auto center shifted to Detroit. More than 80 different makes of automobiles have been built in Cleveland at one time or another.

Cleveland's population and economy continued its rapid growth in the 1900's until the 1960's, and today it is one of the nation's largest economic centers. The seven-county Cleveland Consolidated Metropolitan Statistical Area has a population of more than 2.7 million, ranking 12th in the nation.

Cleveland also is a corporate center, with headquarters for many of the nation's largest companies. Cleveland is the headquarter for 28 of the leading corporations, ranking 4th in the number of *Fortune* 500 industrial corporate headquarters and 12th in the number of non-industrial corporate headquarters. More than 90 companies with annual revenues of more than $100 million have headquarters in the Cleveland metropolitan area.

Cleveland has also become a nationally recognized medical center. Approximately 50,000 Cleveland workers are employed in health-related industries. Cleveland has become a world leader in medical research, especially in the development of new biomedical technologies.

Components of Change

Until recently, growth has characterized Cleveland's economy. Basic structural changes caused by national, rather than local forces, have resulted in a slowdown in the

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George Williams is a research associate and Dr. Cheryl Bolas is research director for the Greater Cleveland Growth Association.

Cleveland economy and other manufacturing centers in the Northeast and North Central regions since the mid-1960's. In addition, total employment in Cleveland is significantly influenced by cyclical trends in the manufacturing sector, expanding and contracting as manufacturing employment increases and decreases during business cycles. Structural and cyclical patterns in Cleveland's total employment trends reflect the divergent trends of the manufacturing and non-manufacturing sector. The long-term change in total employment reflects the growth in the non-manufacturing sector. Until the most recent recession, this sustained growth in the non-manufacturing sector was large enough to offset the decline in manufacturing employment during the last two decades.

On the other hand, short-term cyclical changes in total employment are better explained by the performance of the manufacturing sector. Short-term cyclical downturns in manufacturing are severe enough to pull down total employment, although manufacturing represents only about 24 percent of the total.

Though current employment trends may suggest that Cleveland's economy is stagnant, there are in fact many dynamic forces at work. Changes in total employment over a period reflect only a net change. It is a residual of six components of employment change that hides the dynamic characteristics of the Cleveland economy. Employment gains occur as firms start up and as existing firms expand or migrate to the area. Employment losses occur because of firms that go out of business, contractions caused by layoffs, and outmigration of establishments from the area.

Several revealing findings emerge when looking at the components of employment change. According to a recent study by the Regional Economic Issues Program (Eberts, 1984), there is a significant amount of employment turnover in the Cleveland area. During a period of expansion from 1976-78, total employment in the Cleveland area grew by 20,000 workers. Looking at the components of employment change reveals that more than 220,000 new jobs were added to the local economy while 200,000 were lost.

Therefore, during this two-year period the employment turnover in the Cleveland area amounted to more than 400,000 workers, or slightly less than 50 percent of Cleveland-area jobs. This was significantly higher than the U.S. turnover rate, which was about 35 percent.

Which components of employment change have the greatest impact on the Cleveland economy? Cleveland's rate of job loss through business closings, contraction or outmigration is not significantly different than the national rate. Gross job-loss rates from these three components of employment change are similar in nearly all metropolitan areas. Even high-growth areas in the South and Southwest lost about the same percentage of jobs from these components as areas in the North (Rand, 1982: 29-30).

Also, migration of firms cannot explain employment change in Cleveland. Outmigration of firms leaving the area account for less than 1 percent of Cleveland's employment loss; and, conversely, less than 1 percent of the area's employment gains are because of firms moving into Cleveland. Migration of businesses was an insignificant factor in explaining employment change both locally and in other metropolitan areas in the United States (Rand, 1982: 29-30).

Instead, a study of the Regional Economic Issues Program revealed that the key component to employment change in the Cleveland area is the start-up of new businesses. During the 1976-78 expansion period, start-ups increased employment by 15 percent. But during the 1980-82 recessionary period, employment gains from business start-ups dropped to 9.4 percent. In contrast, employment changes due to business closings, contractions and expansions were similar during both expansion and recession periods in the Cleveland area. As a result, nearly all of the reversal in employment change from the period of expansion to recession was caused by the decrease in jobs created from business start-ups.

Table 1
Manufacturing Employment / (thousands)
(Cleveland PMSA)

Industry Category	1985	Percent
Total	862.8	100%
Manufacturing	210.1	24.4%
Durable Goods	145.9	16.9%
Primary Metals	23.5	2.7%
Blast furnace & basic steel products	10.8	1.3%
Iron & steel foundries	5.5	0.6%
Fabricated Metal Products	33.1	3.8%
Fabricated structural metal products	3.7	0.4%
Screw machine products, bolts, etc.	4.8	0.6%
Metal forgings and stampings	11.1	1.3%
Machinery, Excluding Electrical	32.5	3.8%
Construction and related machinery	3.2	0.4%
Metalworking machinery	10.4	1.2%
Special industry machinery	3.6	0.4%
General industrial machinery	2.9	0.3%
Electric & Electronic Equipment	18.9	2.2%
Electrical industrial apparatus	7.1	0.8%
Transportation Equipment	20.1	2.3%
Motor vehicles and equipment	12.8	1.5%
Instruments and related products	8.3	1.0%
Measuring and controlling devices	4.2	0.5%
Non-durable Goods	65.1	7.5%
Food and kindred products	7.3	0.8%
Apparel and other textile products	4.7	0.5%
Paper and allied products	5.5	0.6%
Printing and publishing	15.5	1.8%
Chemicals and allied products	14.2	1.6%
Rubber and misc. plastics products	12.1	1.4%
Non-manufacturing	652.6	75.6%

Trends

Cleveland is located in the industrial heartland of the United States; and like many Northeastern and Great Lakes metropolitan areas, its role in the U.S. economy is that of a manufacturer of durable goods.

In 1985, manufacturing employment in the Cleveland area averaged 210,000, or about 24 percent of total employment, compared with 20 percent nationally. Manufacturing employment in the Cleveland PMSA is concentrated in durable goods production, but is relatively diversified within durable goods. About 69 percent of Cleveland's total manufacturing employment is engaged in durable goods production, compared with 59 percent in the United States. The five largest durable goods industries that comprise Cleveland's traditional anchor industries include primary metals, fabricated metals, non-electrical machinery electrical machinery and transportation equipment.

The diversity of Cleveland's manufacturing sector is one of the city's major strengths. Within the manufacturing sector, only New York and Saint Louis are more diverse at the three-digit S.I.C. code level. And in major durable goods production industries, Cleveland is far more diversified than any other metropolitan area in the United States. This, and other factors, refute the conception that the Cleveland area is almost entirely dependent on the auto and steel industry or that Cleveland's anchor industries are primarily suppliers of the auto industry (Rand, 1982).

Other evidence can be seen when looking at the export employment of these industries. The Rand study concluded that the Cleveland industry's export-orientation is the most influential stimulant to the local economy. Yet less than 50 percent of employees in Cleveland's motor vehicle industry, and less than 10 percent of the area's employees in the primary metals industry, are producing for export. In contrast, other major durable goods industries have about 80 percent or more of their employment in export production. Other evidence shows that during the expansion period of the last business cycle, both total and export employment in the motor vehicle and steel industries were declining, while total and export employment were increasing in the fabricated metals and non-electrical machinery industries. This suggests that Cleveland's major export industries export to many different kinds of businesses. Decreases in auto and steel sales during this period were offset by increased sales in other industries (Rand, 1982:41).

During the recent recession, the auto, steel and related industries showed a dramatic decline in employment. If these industries were the primary determinants of Cleveland's economic health, many other area industries would have had similar rates of decline, but this did not happen.

While the auto and steel industries are important to Cleveland's economy, the area's economic diversity prevents these industries from being the sole determinants of Cleveland's economic future. Cleveland's diversity provides a variety of opportunities for economic development.

Though Cleveland's economy can be influenced by various events, changes in the export-orientation of Cleveland's major industries have the greatest impact on stimulating Cleveland's economy. Based on earning multipliers (a measure of how much total local income will be generated by an increase in export business) and estimates of export employment for individual Cleveland industries developed by the Rand Corporation, Cleveland's manufacturing durable goods industries have the greatest impact on Cleveland's economy. Cleveland's durable goods industries generate a higher total income in the area by an increase in export business than most other Cleveland industries. The significant impact that durable goods industries have on the Cleveland economy is in contrast to many other metropolitan areas in the United States, where most local income generated by an increase in export business is in the service sector.

"The diversity of Cleveland's manufacturing sector is one of the city's major strengths."

Looking at Cleveland's traditional anchor industries within durable goods reveals more specifically that Cleveland's economic specialty is as an exporter of producers' durable goods, especially fabricated metal products, non-electrical machinery products and electrical equipment products. These industries have both a very large number of export employees and a high proportion of their total employment in export production. For example, Cleveland's fabricated metals industry has an estimated 26,000 more employees than were needed to meet local demand for their products. In contrast, Cleveland's rubber products industry would have to hire 8,000 more employees to meet local demand.

Overall trends in Cleveland's manufacturing sector reflect the long-term structural changes occurring in the national economy; that is, from a manufacturing to a consumption-oriented society resulting in a decrease in manufacturing employment, especially in durable goods, and an increase in non-manufacturing employment, especially in the service sector. Cleveland's manufacturing employment began to decline in the mid-60s, from a peak of 306,800 workers in 1967 to 210,100 employees in 1985 with the most severe losses occurring in the recent back-to-back recessions.

The leading causes of Cleveland's long-term losses in manufacturing employment are national and international in scope. They include: (1) changes in demand for specific manufactured goods; (2) changes in industry structure and competitiveness affecting the traditional durable goods sector; (3) national shift to the South and

Southwest which in turn has resulted in the redistribution of the markets for manufactured products; and (4) development of locational advantages in other areas. In addition, Cleveland's specific role in the U.S. economy is that of an exporter of producer durable goods in the manufacturing sector, buying inputs from other factories and selling the parts and equipment it manufactures to other factories. Consequently, Cleveland's export income is more sensitive to shifts in the national manufacturing sector than many other metropolitan areas.

Looking at employment trends only in Cleveland's major manufacturing sectors indicates a rather dismal outlook for Cleveland's economic future. However, if one looks at component industries of these major groups there is substantial diversity in performance among industries, and a number have done well in maintaining their market share of national employment. These include electrical industrial apparatus, general industrial machinery and miscellaneous durable goods manufacturing (Kingsley, 1982: 41). Several industries have increased employment since 1979. They are instruments and related products, paper and allied products, and printing and publishing in the non-durable goods sector.

In contrast to the long-term decline in the manufacturing sector, Cleveland's non-manufacturing employment has continued to grow, absorbing much of the job losses in the manufacturing sector. Between 1973 and 1985, non-manufacturing employment increased by 61,000, or 10 percent. Within the non-manufacturing sector, the services industry — particularly health and business-related services — had the most rapid employment growth.

Although the service sector has shown strong growth, on closer examination there appears to be little evidence to conclude that Cleveland's economic future rests solely with the service industries. First, while there has been significant employment growth in the majority of Cleveland's non-manufacturing industries, the majority were growing more slowly in Cleveland than at the national level, including Cleveland's fastest growing non-manufacturing industries. Not only are the vast majority of Cleveland's non-manufacturing industries losing their market share of U.S. employment and are therefore not competitively strong, but their national shares also remain substantially below those of most manufacturing industries. Industries in which Cleveland is both competitively strong in the U.S. market and has a significant share of U.S. employment are still concentrated in the manufacturing sector.

Secondly, many of Cleveland's strongest non-manufacturing industries are those directly tied to the local production of goods (including trucking and warehousing) and administrative and auxiliary activities (including headquarter offices). Therefore, the health of the non-manufacturing sector is dependent on the strength of the manufacturing sector. Thirdly, while Cleveland's non-manufacturing sector is large in terms of total employment, the majority of Cleveland's export employment remains in durable goods manufacturing, which has greater potential of economic growth due to its associated higher earning multipliers.

This does not suggest that the non-manufacturing sector is not important to Cleveland's economic well-being. The service sector is a critical component of Cleveland's economy. Cleveland's advantages as a headquarters location and its strength and continuing growth in business-related and health services are important to Cleveland's future. Efforts should continue in development of the service sector to prevent these advantages from eroding. But strong forces shifting the national economy to a service orientation, and the corresponding decrease in local manufacturing employment, does not reflect a change in Cleveland's role in the U.S. economy. Cleveland's greatest strength — its economic specialty and unique role in the national economy — still lies as an exporter of producer durable goods; and support for these manufacturing industries are critical to Cleveland's economy. Because many Cleveland non-manufacturing industries are closely tied to manufacturing, development strategies for non-manufacturing should compliment the manufacturing sector and promote interaction between the two sectors.

Due to Cleveland's specific role in the U.S. economy as an exporter of producer durable goods in the manufacturing sector, the current trends in Cleveland's economy are influenced more by structural and cyclical changes in the national economy than by local economic factors. Cleveland's economic future is also dependent on national responses to boost a sagging manufacturing sector. The key factor to the nation's and Cleveland's future in manufacturing is the amount of new investment in manufacturing plants and equipment. Because exports are the major factor stimulating Cleveland's economy, Cleveland's competitive position in U.S. and world markets is a key determinant of its economic health. For Cleveland and the nation to be competitive, the manufacturing sector must continue to modernize.

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Recession and Recovery in Ohio's Industries

By Dixie Sommers

Overview

Ohio continued on its course of job recovery in 1985, although not as rapidly as in 1984. Last year, the state set a new record for the number of persons in the labor force and experienced modest gains in total employment and non-farm wage and salary employment. Unemployment continued to decline, with the unemployment rate averaging 8.9 percent for the year, compared with 9.4 percent in 1984. Industry employment patterns ranged from healthy increases in construction, trade and services, to declines in manufacturing and mining.

This article reviews these job indicators for 1985, looking at the year in comparison with 1984. It also discusses the state's job losses and recovery between 1979 and 1985 and examines the effects of Ohio's manufacturing industry structure and national manufacturing employment trends.

The Ohio Labor Force in 1985

Ohio's working-age population and labor force reached all-time highs in 1985. (See Table 1.) The working-age population grew by 24,000 persons, reaching a new level of 8.065 million. The civilian labor force increased by 41,000, reflecting the increase in the working-age population and a small rise in the labor force participation rate. The participation rate, which is the portion of the working-age population in the work force, reached 63.6 percent, also an all-time high for Ohio.

Total employment rose by 66,000, or 1.4 percent in 1985, with an average of 4.675 million Ohioans working during the year. Employment remained below its record annual level of 4.760 million in 1979, but 1985 had the highest level since that year. (See Footnote 1.) The number of Ohioans out of work declined in 1985 by 25,000, reaching a new level of 455,000. The unemployment rate also fell, from 9.4 percent in 1984 to 8.9 percent in 1985. Although this modest decline in the unemployment rate shows continuing recovery, it remained uncomfortably high for the year. Among all states, Ohio tied with Alabama for the eighth highest rate, and was above the national yearly average of 7.2 percent.

Since 1983, Dixie Sommers has been director of the Labor Market Information Division, Ohio Bureau of Employment Services. Ms. Sommers also has worked as a labor economist at the Bureau of Labor Statistics and as an occupational information systems specialist at the National Occupational Information Coordinating Committee.

Industry Employment Trends in 1985

While the aggregate labor force data are helpful in summarizing Ohio's employment condition, they do not provide detailed information on the underlying economic trends. For this purpose, data on the state's non-agricultural wage and salary employment by industry are most useful. (See Footnote 2.) According to these data, Ohio's employment rose by 2.8 percent between 1984 and 1985 — a rate higher than the 1.4 percent indicated by the labor force data. The level of employment rose by 118,000 jobs to 4.379 million for the year. (See Table 2.) As with the labor force data, the industry figures show that in 1985 Ohio had not yet returned to its pre-recession record annual job level of 4.485 million reached in 1979.

Ohio continued to follow general national trends in 1985, with the bulk of the job gains coming in the larger non-manufacturing industries, and with declines in manufacturing and mining. Manufacturing industries declined further as a share of total employment in Ohio and in the nation, accounting for 25.6 percent of all non-farm Ohio jobs and 19.9 percent nationally.

In the non-manufacturing sector, three industry groups showed healthy gains in the number of jobs during the year. Construction grew by 6.4 percent, representing the addition of 9,000 jobs and spurred mostly by declines in interest rates late in the year, which boosted housing starts and other construction activity. The retail-trade sector grew at a 5 6 percent rate, gaining 42,000 jobs, with the most rapid growth in eating and drinking places and automobile dealers and service stations. The special financing offers on new cars, declining interest rates and general improvement in personal income levels were probably the most important factors in the job growth in retail trade. Finally, the service-industry sector showed a 5.3 percent increase in employment, gaining 48,000 jobs over the year. This sector has shown strong growth in Ohio and nationally during most of the recovery period, with particular strength shown in business services and health services, except for hospitals.

All other industry groups in the non-manufacturing sector showed job growth in 1985, with the exception of mining and transportation, communications and public utilities. Declines in railroad and communications employment were not entirely offset by the small gains in other transportation and utility industries.

The manufacturing sector in 1985 continued to be a disappointment. Industries in this sector apparently reached the end of their recovery in 1984 and began to show job declines in 1985. A variety of factors were at

work, including competition from foreign producers made more difficult by the high value of the dollar relative to foreign currencies. The trade-weighted dollar value peaked in February 1985 and began to fall rapidly in the last few months of the year. The impact of this improvement was not reflected in the 1985 job figures, as several months' time lag is expected. Manufacturing employment was also affected by continuing problems in the steel and machine tool industries, and by productivity improvements that generally strengthened the competitive positions of some industries but probably reduced the number of jobs.

Manufacturing industries showed an overall 0.3 percent decline in employment in 1985, representing a loss of about 4,000 jobs. This decline was all in the durable goods sector, which fell by 0.6 percent. Non-durable goods employment was virtually unchanged.

Among durable goods manufacturing industries, only the transportation equipment industry showed strong job growth during the year. This growth was largely found in the aircraft and parts sector, which expanded at an 11.9 percent rate, while the motor vehicles sector gained jobs at a 2.1 percent rate. The strong growth for the aircraft sector was largely because of defense-related expansions.

The remaining major durable goods sectors declined in employment, with the most rapid decline found in the primary metals industry, dropping by 5.7 percent, or 6,000 jobs. This loss reflects many factors in the troubled steel industry, including company reorganizations, work stoppages that depressed employment in several months, depressed steel demand, worldwide overcapacity, and foreign competition. Significant employment declines were also seen in electric and electronic equipment production and stone, clay and glass products.

In the non-durable goods manufacturing sector, employment grew significantly only in the printing and publishing industry, which gained about 2,000 jobs, representing a 2.3 percent rate of growth. This gain was mostly offset by job losses in food products and chemicals and allied products.

Table 1
Labor Force Estimates for Ohio, 1984-1985

Labor Force Estimate	1984	1985	Change	Percent Change
Working-age population	8,041,000	8,065,000	24,000	0.3%
Civilian labor force	5,089,000	5,130,000	41,000	0.8%
Total employment	4,609,000	4,675,000	66,000	1.4%
Total unemployment	480,000	455,000	-25,000	-5.2%
Rates (Percentages)				
Labor force participation rate	63.3%	63.6%	—	—
Employment/population ratio	57.3%	58.0%	—	—
Unemployment rate	9.4%	8.9%	—	—

Source: Bureau of Labor Statistics

Metropolitan Industry Trends

As in past years, the growth in non-agricultural wage and salary employment varied greatly among Ohio's largest metropolitan areas. Comparisons among the eight areas for which Current Employment Statistics survey data are tabulated show overall growth rates, ranging from 5.2 percent in Columbus and 4.6 percent in Cincinnati to 1.7 percent in Cleveland and 0.8 percent in Youngstown-Warren. (See Table 3.) These variations are at least partly the result of different industry employment structures among the areas. Cleveland and Youngstown continue to suffer from losses in durable goods manufacturing, partic-

Table 2
Non-Agricultural Wage and Salary Employment in Ohio, 1984-1985

Industry Group	Employment (thousands) 1984	1985	Change	Percent Change
Total Employment	4,260	4,379	118	2.8%
Manufacturing	1,127	1,123	-4	-0.3%
Durable Goods	773	769	-4	-0.6%
Stone, clay and glass products	53	50	-2	-4.0%
Primary metal industries	109	103	-6	-5.7%
Fabricated metal products	139	139	0	0.1%
Non-electrical machinery	167	166	-1	-0.7%
Electric & electronic equipment	93	91	-3	-2.8%
Transportation equipment	145	152	7	4.7%
Non-durable Goods	354	354	0	0.1%
Food and kindred products	63	63	0	-0.2%
Printing and publishing	65	67	2	2.3%
Chemicals and allied products	63	62	0	-0.5%
Rubber and misc. plastics products	91	91	0	0.2%
Non-manufacturing	3,133	3,256	122	3.9%
Mining	28	26	-1	-5.0%
Construction	145	154	9	6.4%
Special trade contractors	89	95	6	7.2%
Transportation & Public Utilities	204	203	-1	-0.7%
Transportation except railroads	93	95	2	2.4%
Communication, electric & gas	92	90	-2	-2.2%
Wholesale Trade	237	247	10	4.1%
Durable goods	150	157	7	4.5%
Non-durable goods	87	90	3	3.6%
Retail Trade	748	790	42	5.6%
General merchandise stores	115	113	-1	-1.0%
Food stores	120	126	5	4.3%
Auto dealers & gas stations	82	87	5	6.3%
Eating and drinking places	258	277	19	7.3%
Finance, Insurance & Real Estate	212	218	7	3.2%
Banking	58	60	2	2.8%
Insurance carriers	58	58	1	1.2%
Services	905	953	48	5.3%
Personal services	49	52	3	6.8%
Business services	153	174	21	14.0%
Health services	322	329	7	2.1%
Educational services	58	60	1	2.4%
Government	655	665	10	1.4%
Federal government	89	92	2	2.6%
State government	141	143	2	1.6%
Local government	425	430	5	1.2%

Source: Ohio Bureau of Employment Services, Labor Market Information Division. Includes major industry divisions and industry groups with 50,000 or more jobs in 1985. The change and percent change are calculated from data not rounded to the nearest thousand.

Table 3
Percent Change in Non-Agricultural Wage and Salary Employment, 1984-1985, by Industry Division and Metropolitan Statistical Area

	Percent Change in Employment, 1984-1985							
	Akron	Canton	Cincinnati	Cleveland	Columbus	Dayton-Springfield	Toledo	Youngstown-Warren
Total Employment	2.4%	2.1%	4.6%	1.7%	5.2%	3.8%	2.9%	0.8%
Manufacturing	0.0%	-0.2%	1.5%	-1.4%	1.1%	2.6%	1.2%	-4.7%
Durable goods	1.1%	-0.9%	2.3%	-1.7%	1.9%	2.8%	1.2%	-5.0%
Non-durable goods	-1.2%	2.7%	0.5%	-0.9%	0.0%	2.1%	1.5%	-1.9%
Non-manufacturing	3.3%	3.1%	5.5%	2.8%	6.1%	4.3%	3.4%	3.1%
Construction	9.2%	12.2%	6.8%	0.7%	12.0%	12.4%	7.6%	14.5%
Transportation & public utilities	-1.5%	-3.2%	3.7%	-0.7%	-0.8%	-1.4%	-2.1%	-2.6%
Wholesale trade	3.1%	1.3%	4.3%	2.8%	6.7%	3.8%	-1.3%	7.3%
Retail trade	4.7%	5.1%	6.4%	3.5%	8.4%	5.6%	5.5%	4.0%
Finance, insurance & real estate	4.3%	0.0%	4.1%	1.9%	5.1%	3.7%	5.2%	2.8%
Services	3.4%	4.5%	7.6%	4.9%	8.5%	5.9%	4.3%	2.2%
Government	1.5%	0.0%	2.3%	0.5%	2.1%	1.0%	2.3%	0.9%

Source: Ohio Bureau of Employment Services, Labor Market Information Division

Table 4
Ohio Employment Losses and Recovery by Industry Group, 1979 – 1983 – 1985

Industry Group	Non-Agricultural Wage and Salary Employment			Employment Change		
	1979	1983	1985	79-83	83-85	79-85
Total Employment	4,485	4,093	4,379	-392	286	-106
Manufacturing	1,382	1,066	1,123	-316	57	-259
Durable Goods	981	724	769	-257	46	-211
Stone, clay and glass products	70	52	50	-18	-2	-19
Primary metal industries	159	104	103	-55	-1	-56
Fabricated metal products	176	130	139	-46	9	-37
Non-electrical machinery	224	154	166	-69	12	-57
Electric & electronic equipment	118	89	91	-28	1	-27
Transportation equipment	166	132	152	-34	20	-14
Non-durable Goods	402	342	354	-59	12	-48
Food and kindred products	74	63	63	-11	-1	-12
Printing and publishing	68	63	67	-5	4	-1
Chemicals and allied products	68	63	62	-5	-1	-6
Rubber and misc. plastics products	107	83	91	-24	8	-16
Non-manufacturing	3,103	3,027	3,256	-76	229	153
Mining	32	27	26	-5	0	-5
Construction	183	131	154	-52	23	-29
Special trade contractors	106	79	95	-26	16	-11
Transportation & Public Utilities	232	199	203	-34	4	-30
Transportation except railroads	107	86	95	-21	9	-12
Communication, electric & gas	93	93	90	0	-3	-3
Wholesale Trade	233	223	247	-10	24	14
Durable goods	152	140	157	-12	17	5
Non-durable goods	81	83	90	2	7	9
Retail Trade	742	711	790	-31	79	47
General merchandise stores	129	112	113	-18	2	-16
Food stores	117	117	126	0	8	9
Auto dealers & gas stations	89	76	87	-13	11	-2
Eating and drinking places	229	243	277	14	34	48
Finance, Insurance & Real Estate	201	208	218	7	11	18
Banking	57	59	60	1	1	3
Insurance Carriers	58	58	58	0	0	0
Services	806	873	953	67	80	147
Personal services	47	47	52	0	5	5
Business services	119	131	174	11	43	55
Health services	265	319	329	54	10	64
Educational services	54	58	60	4	2	6
Government	674	656	665	-18	9	-9
Federal government	91	89	92	-2	3	1
State government	138	140	143	2	3	5
Local government	445	427	430	-18	3	-15

Source: Ohio Bureau of Employment Services, Labor Market Information Division. Includes major industry divisions and industry groups with 50,000 or more jobs in 1985.

ularly steel and machine tools. Areas with economies less dependent on manufacturing, such as Columbus and Cincinnati, continue to fare better than the state average.

Non-manufacturing industries showed job growth in all eight areas at rates at or above the state average of 2.8 percent for all industries. Non-manufacturing jobs grew fastest in Columbus, at 6.1 percent, and in Cincinnati, at 5.5 percent. Non-manufacturing jobs grew slowest in Canton and Youngstown-Warren, both at 3.1 percent, and in Cleveland, at 2.8 percent.

Manufacturing showed a variety of patterns among the metropolitan areas, ranging from an increase of 2.6 percent in Dayton-Springfield to a decline of 4.7 percent in Youngstown-Warren. Declines were also found in Canton, down 0.2 percent, and Cleveland, down 1.4 percent. The manufacturing growth in the Dayton-Springfield area was fairly well balanced between durable and non-durable goods jobs, reflecting small gains spread across the area's manufacturing base. The largest gain was 1,400 jobs in transportation equipment production. On the opposite end of the scale, Youngstown-Warren lost both durable and non-durable goods manufacturing jobs, although the 5.0 percent rate of loss in durable goods was much higher than the 1.9 percent loss in non-durables. Durable goods losses were mostly in primary metal industries.

Nearly all areas showed strong job growth in construction. Youngstown-Warren showed the strongest gain, at 14.5 percent, reflecting construction activity to repair the damage caused by the May 1985 tornadoes. Canton, Columbus and Dayton-Springfield also had double-digit job growth in construction, while Cleveland's growth was only 0.7 percent.

Transportation, communications and public utilities lost jobs in all areas except Cincinnati. The trade sectors showed generally strong growth in employment across all eight areas, with retail trade growing faster than wholesale in all areas except Youngstown-Warren. The only job loss in trade was a 1.3 percent decline in wholesale trade jobs in the Toledo area. The finance, insurance and real estate sector grew in all areas except Canton, where it was unchanged. The most rapid job growth in the finance sector was in Toledo and Columbus, at 5.2 and 5.1 percent respectively.

The services industry gained jobs at a healthy pace in nearly all metropolitan areas, with rates of growth ranging from 8.5 percent in Columbus and 7.6 percent in Cincinnati, to 2.2 percent in Youngstown-Warren. Government employment was either unchanged or grew slowly in most areas, with the most rapid rate of growth at 2.3 percent for Cincinnati and Toledo.

Table 5
Analysis of Ohio Manufacturing Employment Change, 1979-1985

	Change in Wage and Salary Employment (thousands)		
Industry Group	Actual Change	Expected Change with U.S. Rate of Change	Actual Change Minus Expected Change
Manufacturing	-259	-165	-94
Durable Goods	-211	-153	-58
Stone, clay and glass products	-19	-11	-8
Primary metal industries	-56	-60	4
Fabricated metal products	-37	-26	-11
Non-electrical machinery	-57	-35	-23
Electric & electronic equipment	-27	-7	-20
Transportation equipment	-14	-12	-2
Non-durable Goods	-48	-12	-36
Food and kindred products	-12	-5	-7
Printing and publishing	-1	11	-12
Chemicals and allied products	-6	-4	-2
Rubber and misc. plastics products	-16	-4	-11

Table 6
Analysis of Ohio Manufacturing Employment Change, 1979-1983 and 1983-1985

	Change in Wage and Salary Employment (thousands)		
Industry Group	Actual Change	Expected Change with U.S. Rate of Change	Actual Change Minus Expected Change
Recession Period, 1979-1983			
Manufacturing	-316	-237	-80
Durable goods	-257	-209	-48
Non-durable goods	-59	-27	-32
Recovery Period, 1983-1985			
Manufacturing	57	65	-8
Durable goods	46	51	-6
Non-durable goods	12	14	-2

Recession and Recovery in Ohio Industries

In 1985 Ohio continued to recover from the job losses suffered during the recessions of the early 1980's, although the jobs being gained are not always directly replacing the jobs lost. Table 4 shows the annual average non-farm payroll employment by industry for: 1979, the most recent year of peak employment; 1983, the recession trough; and 1985. The table also shows the employment changes between: 1979 and 1983; 1983 and 1985; and 1979 and 1985.

Across all industries, Ohio lost 392,000 jobs between 1979 and 1983. About 316,000 of these jobs were in manufacturing, which bore the brunt of the downturn, especially in durable goods. Non-manufacturing also lost significant numbers of jobs, particularly in construction, transportation and public utilities, and trade. The only sectors which gained jobs during the period were finance, insurance and real estate, which added about 7,000 jobs, and the service sector, which added 67,000, mostly in health services.

Within manufacturing, the largest job losses were in the basic industries, which usually are cyclical and were especially hard hit by the recession's combination of declining demand and intense foreign competition fostered by high U.S. interest rates, high dollar values and lack of competitiveness among some American producers. Ohio lost 55,000 jobs in primary metals, mostly in basic steel production; 46,000 jobs in fabricated metal products; 69,000 jobs in non-electrical machinery; 28,000 jobs in electric and electronic equipment; and 34,000 jobs in the transportation equipment sector, mostly in auto production. In the non-durable goods industries, the largest losses were in rubber and miscellaneous plastics products.

During the recovery period of 1983-85, Ohio gained about 286,000 jobs, but remained 106,000 below the 1979 peak. Only 57,000 of the jobs gained were in manufacturing, compared with the 316,000 lost. In 1985 Ohio's manufacturers provided 259,000 fewer jobs than before the recession. A significant part of this problem is structural, since Ohio's manufacturing sector is dominated by the industries which nationwide suffered the heaviest losses and have had the slowest recovery or have continued to show losses, such as the glass and steel industries. Last year, all of the state's important manufacturing industries remained below their 1979 employment levels. (The latter part of this article discusses Ohio's manufacturing structure in more detail.)

The largest number of manufacturing jobs gained since 1983 has been in the transportation equipment sector, which was up by 20,000 over the two years. The non-electrical machinery industry had the next largest growth, all of which occurred in 1984. This sector declined in 1985, as discussed earlier.

In non-manufacturing, Ohio has more than fully recovered its job losses in wholesale and retail trade, and has seen further growth in the finance and services sectors, which did not lose jobs during the recession. The improvement in retail trade has been uneven, however, with general merchandise stores, auto dealers and gas stations still below their 1979 levels. Government employment also was below its 1979 level, with gains in federal and state government employment moderated by slower improvement in the local government sector, mainly local public education.

Among all industries, the largest number of jobs gained since 1979 is found in health services, which gained 64,000. Nearly all of this improvement was in the non-hospital sector. Employment in hospitals has fallen since 1979 because of cost-cutting measures resulting in fewer and shorter hospital stays and less expensive outpatient care. Employment in nursing homes, clinics and offices of health practitioners has grown quickly, more than offsetting the losses in hospitals. Business services have also gained significant numbers of jobs, up 55,000 since 1979.

Effects of Ohio's Manufacturing Structure

The severe job losses in Ohio's manufacturing industries between 1979 and 1983, and the relatively small number of factory jobs recovered, raise questions about the effects of the structure of the state's economy on its cyclical performance. It should be expected that Ohio will fare worse than the nation during a cyclical downturn, because the sensitive manufacturing sector accounts for a larger part of the state's jobs than of the nation's. In 1979, manufacturing provided 30.8 percent of Ohio's non-farm payroll jobs, compared with 23.4 percent of the nation's. More than 70 percent of Ohio's factory jobs were in durable goods industries.

How much of Ohio's manufacturing downturn reflects the nationwide decline of the particular set of industries found here? The analysis presented below suggests that of the 259,000 manufacturing jobs lost between 1979 and 1985 about 165,000, or about 64 percent, were lost because of the national declines. The remaining loss of 94,000 must be attributed to the shift of jobs in Ohio's important industries to other regions.

Table 5 presents the results of an analysis of employment change in Ohio's manufacturing sectors. The table shows the actual employment change between 1979 and 1985 for the larger industry groups. The table also shows the change in employment that would be expected if the U.S. rates of change between 1979 and 1985 were applied to Ohio's 1979 employment levels. Calculation of this "expected" change was done by using data at the three-digit industry level in an attempt to account for the dominance or absence of certain industries in the state. In the non-electrical machinery industry, for example, use of finer detail makes allowance for the fact that in Ohio this sector is heavily tilted toward metal-working machinery and general industrial machinery, which suffered losses nationally. In this same sector, Ohio has relatively few jobs

in computer and office equipment manufacturing, which grew rapidly during the recession. (See Footnote 3.)

Table 5 also shows the difference between the actual and the "expected" job losses. These figures may be considered to represent the manufacturing job losses or gains in Ohio not attributable to the overall national rates of employment change by detailed industry.

The analysis shows somewhat different results for durable and non-durable goods industries. For durable goods, the loss of 153,000 jobs expected from national decline accounts for about 73 percent of the 211,000 actual losses. For non-durables, national rates of employment change account for a loss of 12,000 Ohio jobs, or only 25 percent of the 48,000 actually lost.

Within the durables sector, the national rates of change for primary metal industries imply a greater loss for Ohio than actually occurred. This means that, while Ohio lost jobs in the steel industry between 1979 and 1985, the rate of loss was somewhat slower than nationally. Loss at the national rate would have resulted in an additional decline of 4,000 jobs. Review of the detailed data (not shown) indicates that about half of this additional decline would have been in the blast furnaces and basic steel sectors. As severe as these losses have been in Ohio, they are marginally less than national rates, even in the basic steel sector.

In all the remaining large durable goods industries, Ohio lost more jobs than expected from national rates of change. The largest difference — 23,000 — was in the non-electrical machinery industry, where Ohio's producers of machine tools, construction equipment and refrigeration equipment lost more jobs than expected. The electrical and electronic equipment industry lost 20,000 more jobs than expected from the national rate of loss. Most of these were scattered across detailed industries which are not large in Ohio; but a significant number were also attributed to Ohio losses in communications equipment manufacturing, which increased slightly nationwide. Fabricated metal products industries lost 11,000 more jobs than expected from national trends, while the transportation equipment sector lost only an additional 2,000. In the latter case, Ohio gained more jobs than expected in aircraft manufacturing, and lost slightly more than expected in motor vehicles.

In non-durable goods, most of the "extra" job losses were in printing and publishing, which grew nationally but declined slightly in Ohio, and in rubber and miscellaneous plastics products. Within rubber and plastics, Ohio's plastics employment was unchanged between 1979 and 1985, while the industry gained jobs nationally.

In interpreting the difference between Ohio's actual job losses and the changes expected because of national patterns, it may be useful to look at the data separately for the recession period and the recovery period. Table 6 presents an analysis for total manufacturing and durables and non-durables for these two periods. (See Footnote 4.) These data indicate that Ohio parted much further from national trends during the recession period than during the recovery, which in manufacturing has been modest for both the state and the nation.

Between 1979 and 1983, Ohio lost 316,000 manufacturing jobs, including 257,000 in durable goods and 59,000 in non-durables. If Ohio had followed national rates of change in each specific industry, the overall decline would have been 237,000, or about 75 percent of the actual loss. In durable goods, national trends account for a loss of 209,000, or 81 percent of the actual loss. In non-durables, national trends indicate a loss of 27,000 jobs, representing about 46 percent of the actual.

During the recovery period, Ohio has regained about 57,000 manufacturing jobs, about 8,000 less than expected because of national growth rates. Some 46,000 of the actual jobs gained have been in durable goods industries, about 6,000 less than expected. In non-durable goods, Ohio has recovered about 12,000 jobs, or 2,000 less than expected.

In general, it appears that at least during the most recent cycle, a significant part of Ohio's manufacturing job losses reflect the national trends for the specific industries found in the state. This is particularly apparent in the durable goods sector and during the recessionary period of the business cycle. Because these industries dominate Ohio's economy, the overall rate of job loss in Ohio is greater than the nation's. However, Ohio's industry structure and the national declines in Ohio's important industries do not account for all of the state's manufacturing losses.

The current picture suggests that Ohio will reach full recovery of its recessionary job losses in 1986, as measured on an annual basis. Recent declines in interest rates, oil prices and the value of the dollar may help stem the continuing losses in manufacturing and are likely to boost consumer spending and, consequently, employment in consumer goods and services industries.

Footnotes

[1] The monthly labor force data for 1986 so far show Ohio breaking its 1979 monthly peak employment level. The state began recording record high employment levels, as measured by the total employment data, beginning in February 1986.

[2] These data are from the Current Employment Statistics survey conducted by the Ohio Bureau of Employment Services in cooperation with the U.S. Department of Labor. This survey counts the number of wage and salary jobs, by place of work, through a survey of more than 10,000 non-farm employers in Ohio each month. Results of the survey are published in the Bureau's *Labor Market Review*. Detailed 1985 industry data will be available in the 1985 annual issue of the *Labor Market Review*.

[3] Table 5 was calculated using the three-digit Standard Industrial Classification categories for which Ohio data are published in the *Labor Market Review*. Industries not published were treated as residuals, with employment levels calculated by subtracting data for published industries from the appropriate two-digit totals. National rates of growth for the residuals were used and may not reflect Ohio's structure adequately. A table showing the complete calculations is available upon request of the author.

[4] The results for 1979-83 and 1983-85 cannot be summed to obtain the results for 1979-85 presented in Table 5, because the 1983-85 "expected" data were calculated by applying the national rates of employment change to Ohio's 1983 industry structure.

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